

Flight, April 13, 1912.

FLIGHT

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MOTOR BOAT RACING AT MONACO AS SEEN FROM RENAUX'S FARMAN BIPLANE.—A snap of "Sigma III" the racing craft which made such splendid time in the Omnium Race.

EDITORIAL COMMENT.

Fools and Angels.

It is but seldom that we feel called upon to go out of the way to traverse the often ill-informed statements of our lay contemporaries, even though we may sometimes be inclined to reply to matters that seem directly or indirectly to affect ourselves. It is a good maxim of life that every individual has the right to his own opinions and, in this free country of ours, an equal right to its expression within the bounds of the ordinary decencies. And it is well that it should be so, for there is nothing like proper criticism for keeping to the straight and narrow path those who hold in their charge any sort of public responsibility. We say advisedly, *proper* criticism, for it comes to us that some of the tirades that pass as criticism, which have recently been levelled against all and sundry who happen to be concerned with the direction of national aeronautic policy, do pass the bounds of those decencies to which we have referred. The cudgelling of the Government and its advisers is a cheap and a safe game, especially in the case of the latter, for their hands are shackled by regulations and they have no right, not even a permissive one, of reply. Not that we would hold either the Government of the day, whatever its political colour, or its advisers sacrosanct and immune from criticism within legitimate bounds. Indeed, there have been no more severe critics than ourselves when the Government was apparently inert in the matter of aerial defence, but *now that it is obviously making a move in the right direction* and working to make up lost ground, we can see neither sense nor reason in an indiscriminate application of the lash.

Particularly is this so when, as we have noticed is often the case, the accusations grow from a bed of inaccuracy. Some of the "critics" who are now supporting the columns of our contemporary general press do not appear to have taken the trouble to make themselves quite *au fait* either with the Government's policy or with the machinery incidental to its operation. There has been much talk of useless Committees and worse than useless individuals, whose names seem to have been dragged into the limelight at random and subjected to any sort of abuse that first comes handy. Some articles that we have seen confuse the whole personnel in a hopeless jumble and in case any of our own readers may have doubts as to what is what in this matter, it may perhaps be excused us if we briefly survey the situation as it exists at present. In doing this we have no wish whatever to take up the cudgels against our contemporaries, but merely to put readers of **FLIGHT** in possession of such facts as may enable them to judge of the value of particular comment for themselves.

Much confusion, for example, has arisen concerning the identity of the Advisory Committee and the committee to which Col. Seely referred indirectly as his technical advisers. In some articles they are regarded as identical bodies. As a fact, they are entirely separate institutions, and it is not surprising that there should have been some little mix up on the part of those anxious to seize their victims indiscriminately, since one of the two committees is a secret body of which it is safe to say that no one outside the members thereof know the full personnel.

Its existence as a committee is evident from the fact that it has called witnesses, and, for the same reason, individual members of it have become known; further, it is clearly a sub-committee of the Committee of Imperial

Defence, as may be argued both from the place of its meeting and the nature of the indirect references made to its work. Now the Committee of Imperial Defence consists of the Prime Minister himself, who attaches to him those whom he needs for any particular work. Each committee thus formed is extremely secret in its character.

In so far as Col. Seely has referred to advisers, the particular sub-committee of the Committee of Imperial Defence that deals with aeronautics may be held responsible for the Government attitude towards the movement. What that attitude is, the Government has made, in our opinion, but a poor attempt to explain, particularly with regard to the purchase of British and foreign machines. It would, of course, be of the utmost service by way of clearing the unpleasantly dense atmosphere that is now arising from the fires of indignation that have been burning so fiercely at the Government's delay in making a start, if the Government were to issue a really carefully prepared statement of its intentions with regard to the British industry in a form sufficiently definite and concise to enable manufacturers to have a fair idea of what sort of orders they may expect in the near future. But, any such precise statement of programme concerning a national armament is precisely what this Government dislikes to disclose, consequently the people most concerned have to exist on a hope that is none too well fortified.

There is no doubt, however, from what has been said at one time or another by responsible people, that the Government intends to regard the aeroplane as an armament and to follow the national policy of constructing it, in common with other armaments, in home factories. Likewise it has been rendered definitely clear that the Government has no intention of utilising the Royal Aircraft Factory as a competitive factory against commercial concerns in the construction of aeroplanes in quantity for supplying the new arm.

The other side of the matter, which has given rise to the fiercest comment is the very clear but somewhat unfortunately expressed determination of the Government to allow no question of nationality to stand in the way of the equipment of the new arm with the best possible *types* of machine. There are some types of machine that have admittedly been developed to a greater degree on the Continent than in England, consequently it is obviously the Government's intention to purchase a sufficient number of these machines from abroad (but through the proper English representatives of the firms in question, we most decidedly hope), in order that the necessary experience may be available with the minimum of delay to enable the authorities to decide which of the said types they will require to be constructed in England thereafter. If any should ask why does the Government not commission British firms to build copies of these foreign machines in the first instance, the reply is merely that it is only common sense to gain the necessary initial experience with the originals. To do so is only fair to the army pilot and to the British manufacturer. By using the original you make sure, in the first instance, of the machine, and the pilot is relieved of doubt. When, afterwards, the British manufacturer supplies the necessary duplicates, he, in turn, has the satisfaction of knowing that his reputation is not jeopardised by an inexperienced man. Nothing could possibly be worse for the British firms that are so anxious and properly expectant to receive

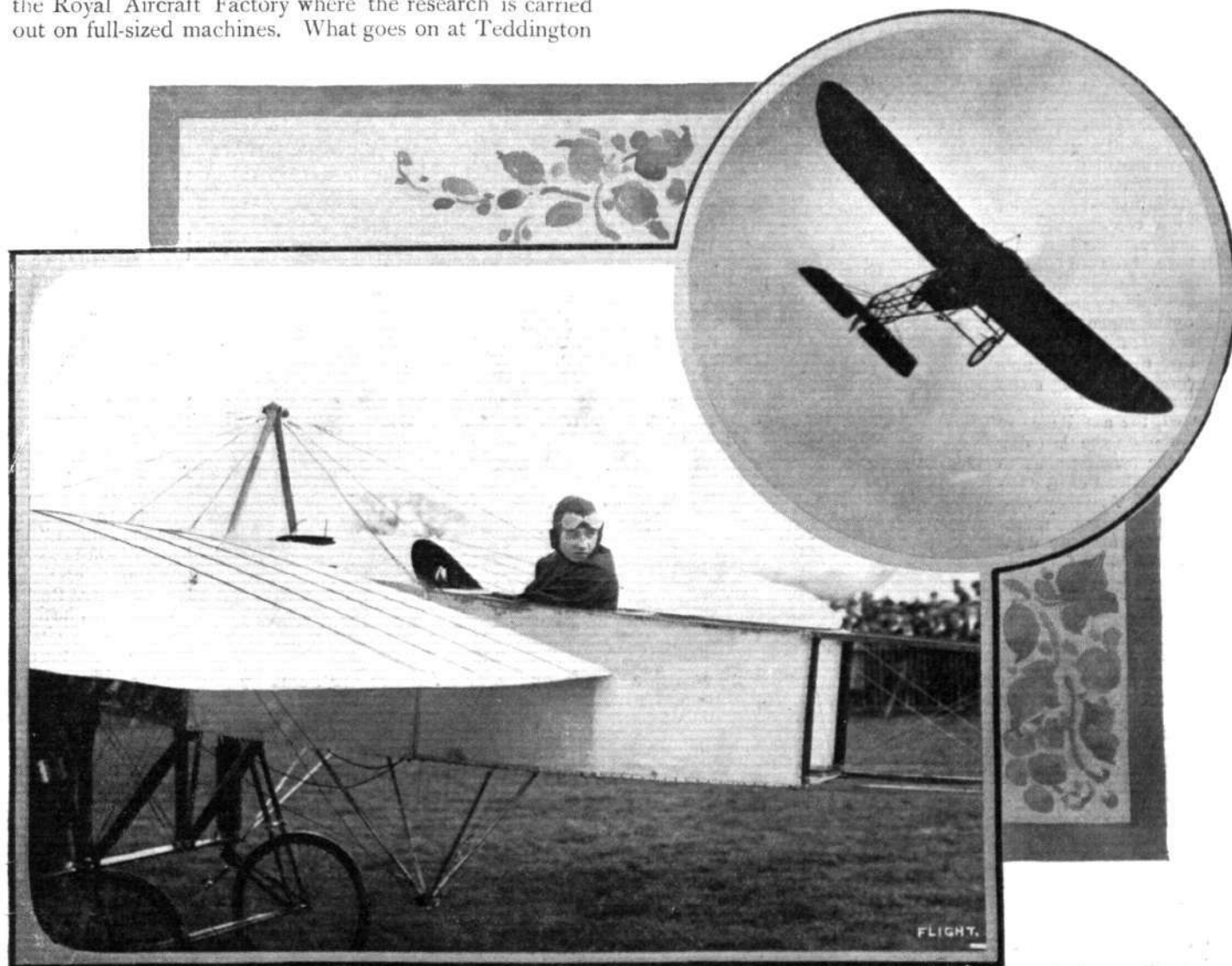
Government encouragement, for machines of their construction but of foreign type, to risk the chance of being condemned solely because of the pilot's prejudice or hesitation with regard to *learning* to fly an improved copy without the moral support that he would naturally feel in the reputation of an original machine.

So much for the question of aeroplanes in the bulk; there remains the Government's research work. This scientific work is under the direction of the Advisory Committee. Of its eleven members seven are Fellows of the Royal Society, which is the best possible guarantee of their mental faculties being thoroughly trained in science. And, it is a sound scientific council of this kind that is most to be desired in the regulation of aeronautical research, for there is no subject on which it is easier for the thinking apparatus of man to lose its way. Aeronautics is not the prerogative of "the inventor of a flying machine who has studied the subject for the last twenty years," and although there are many such who very readily claim to know all there is to know, we venture to think that the science as a science is likely to yield more real data in the long run to the penetrating minds of those who are trained and have had long experience in scientific research in general.

The Advisory Committee has two outlets for the practical expression of its mental activities. One is the National Physical Laboratory, where the small scale experiments in aeronautics are conducted, the other is the Royal Aircraft Factory where the research is carried out on full-sized machines. What goes on at Teddington

and what goes on at Farnborough is very thoroughly known to the Advisory Committee and to say, as has been said, that the Aircraft Factory has cost an immense sum of money and has *produced* only two aeroplanes is merely to argue that the purpose of the factory is quantity production, which, as has already been stated, it is not. As a matter of fact the factory has designed and built a few things, including portable sheds and mooring masts for dirigibles, which have been rather creditable engineering achievements but for which it is too much to hope that it will receive credit. Similarly, the National Physical Laboratory has laid down research plant with which it is hoped to produce results of superior accuracy to those of any foregoing investigators either there or any other place in the world. Such preliminary work is slow, however, and to hurry it unduly is to court disaster from the first.

Such is, as briefly as possible, the outline of the Government's policy and mechanism for effecting it, so far as we have been able to understand either. It is abundantly clear, however, that a majority still doubts the good faith of the one and the efficacy of the other, wherefore we feel disposed very strongly to urge the powers that be to stretch a point towards giving a more complete and lucid statement of the future programme, both as regards machines and engines than hitherto they have deemed politic, in order that a little public-spirited enthusiasm may take the place of the present wet blanket. A wholesome fillip is badly needed just now.



Mr. Gustav Hamel at the wheel of his 70-h.p. Blériot with which he made his splendid altitude flight at Hendon. Inset Mr. Hamel is seen during one of his fine bankings.

HENDON AVIATION MEETINGS.

The Inauguration.

ALTHOUGH the elements were at their worst possible behaviour during the Easter vacation, and although, naturally, the amount of flying at the first London Aerodrome meeting suffered considerably, it would be unfair to term the event other than a success. For what flying took place during these four days was of the highest possible order. It was a glaring example of the sheer cussedness of things that Sunday, which was set apart solely for exhibition flights, should be so eminently suitable for flying, while the weather on the other three days, on which should have taken place the competitions which formed the essence of the meeting, was so antagonistic. Seemingly, for the first time on record, the spectators appeared to have some understanding of the difficulties besetting flight under unfavourable conditions, for although blank intervals were fairly frequent, they did not express their impatience, and left the ground undoubtedly satisfied that everything possible had been done to provide them with their money's worth of amusement. That the meeting was successful from the promoters' point of view goes without saying, for a throng of 15,000 paid for admission on the Friday, 13,000 on the Saturday, 8,000 on Sunday, and again 8,000 on Easter Monday. The number of people in the neighbourhood of the aerodrome on this last day of the meet rather reminded one of the conditions at the start of the *Daily Mail* circuit from Hendon last summer, and it was clear that had the wind entered into the holiday spirit and exerted itself to a considerably less degree, there would have been a record gate. Considering that the public were warned by megaphone and by big placards, that owing to the unfavourable conditions flying could certainly not be guaranteed, the attendance of 8,000 on the last day of the meeting was, to say the least of it, comforting. And they were certainly not disappointed, for they were treated to a feat that scarcely any other pilot than Grahame-White would attempt, that of flying a Farman biplane with two passengers up in a most unsteady wind, fluctuating from 35 to 50 miles per hour.

One cannot but admire Grahame-White all the more for his determination, when he asserted on Sunday that, wind or no wind, he would fly the following day. He kept to his promise even though he suffered to the extent of slightly spraining his ankle, and of sacrificing an old Farman biplane that, before it was rebuilt after his return from his first visit to the States, had served him in his countless exhibitions since the Wolverhampton meeting of 1910.

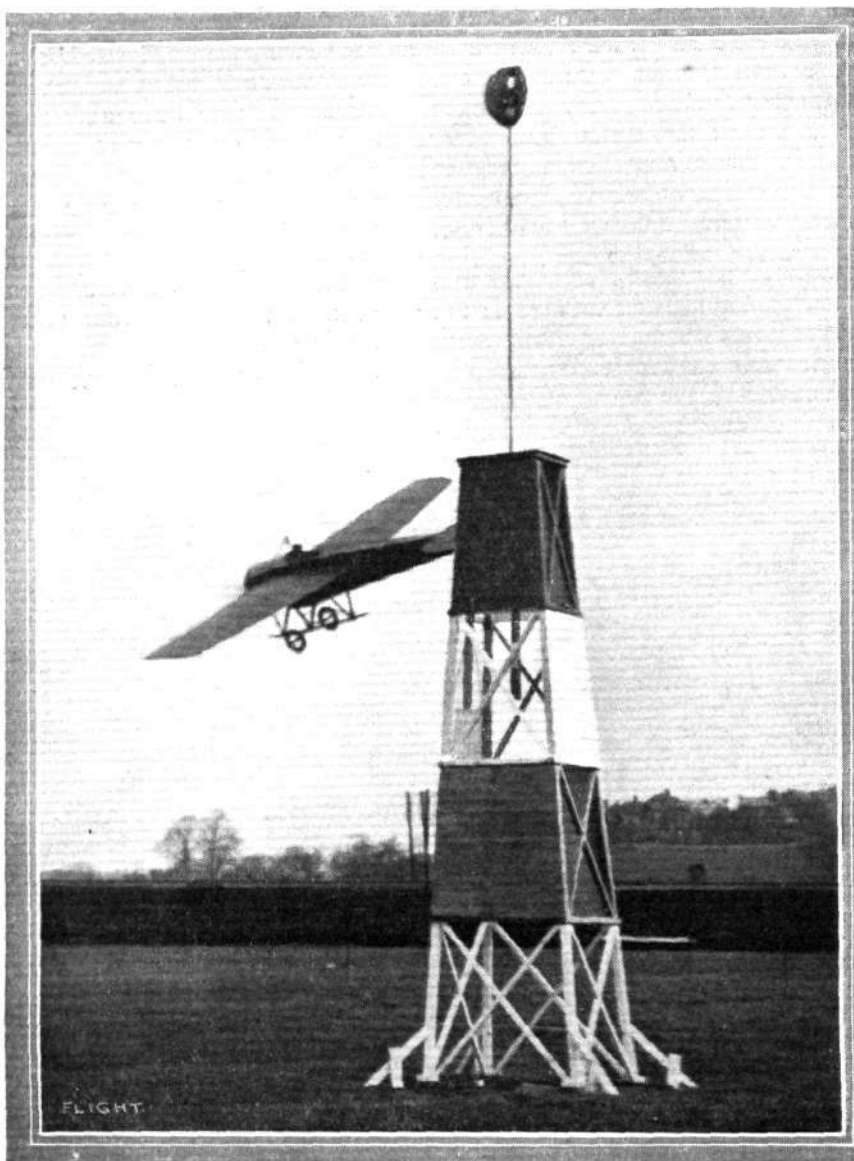
As a result of the unfavourable weather, although flying was provided on each day of the meet, only one competition out of the nine on the programme was contested, that of the altitude contest on the first day by Mr. Gustav Hamel. Even in this single competition there was only one entry, but so splendid a flight did Mr.

Hamel put up that undoubtedly the judges will waive the conditions relating to the validity of the tests owing to the lack of starters and award Mr. Hamel the prize for that event. It is understood that the remainder of the competitions will be competed for at a second meeting which it is hoped will take place within the next month at Hendon.

Good Friday, April 5th.

A wind registering anything between 20 and 30 miles an hour on the aerodrome anemometer, an instrument which seems to estimate the wind at about 70 per cent. of its true velocity, did not augur well for much flying. However, at about half-past three, Grahame-White brought out a Farman-type biplane that had just been completed in his works, and flew along the front of the enclosures. The state of the wind, and the difficulty of keeping good control

over the machine with the ailerons of the Curtiss-type, with which this biplane is fitted, did not make things any too happy for him. He did not remain out with that machine long, for he returned to the hangar and changed it for one of his old Farman with ordinary ailerons, on which he flew twice round the ground, receiving an unusual amount of buffeting while he was in the air, and quite a lot of cheering when he landed in the space between the half-crown and the 1s. 6d. enclosures. During the interval that elapsed the crowd were kept amused by a succession of daylight fireworks that the management had wisely arranged for in view of the possibility of the weather being against flying. Within half an hour it was announced by megaphone from the judges' stand that Hamel would make an exhibition flight on the Blériot. Starting up into the wind, he quickly rose to about 500 ft. Against the wind he scarcely seemed to be moving at all, and when he turned down wind he could not have been doing much less than 95 miles an hour. Rocking considerably, he flew a couple of circuits, mostly outside the aerodrome, then rushing down wind to the Golders Green end of the ground, made a



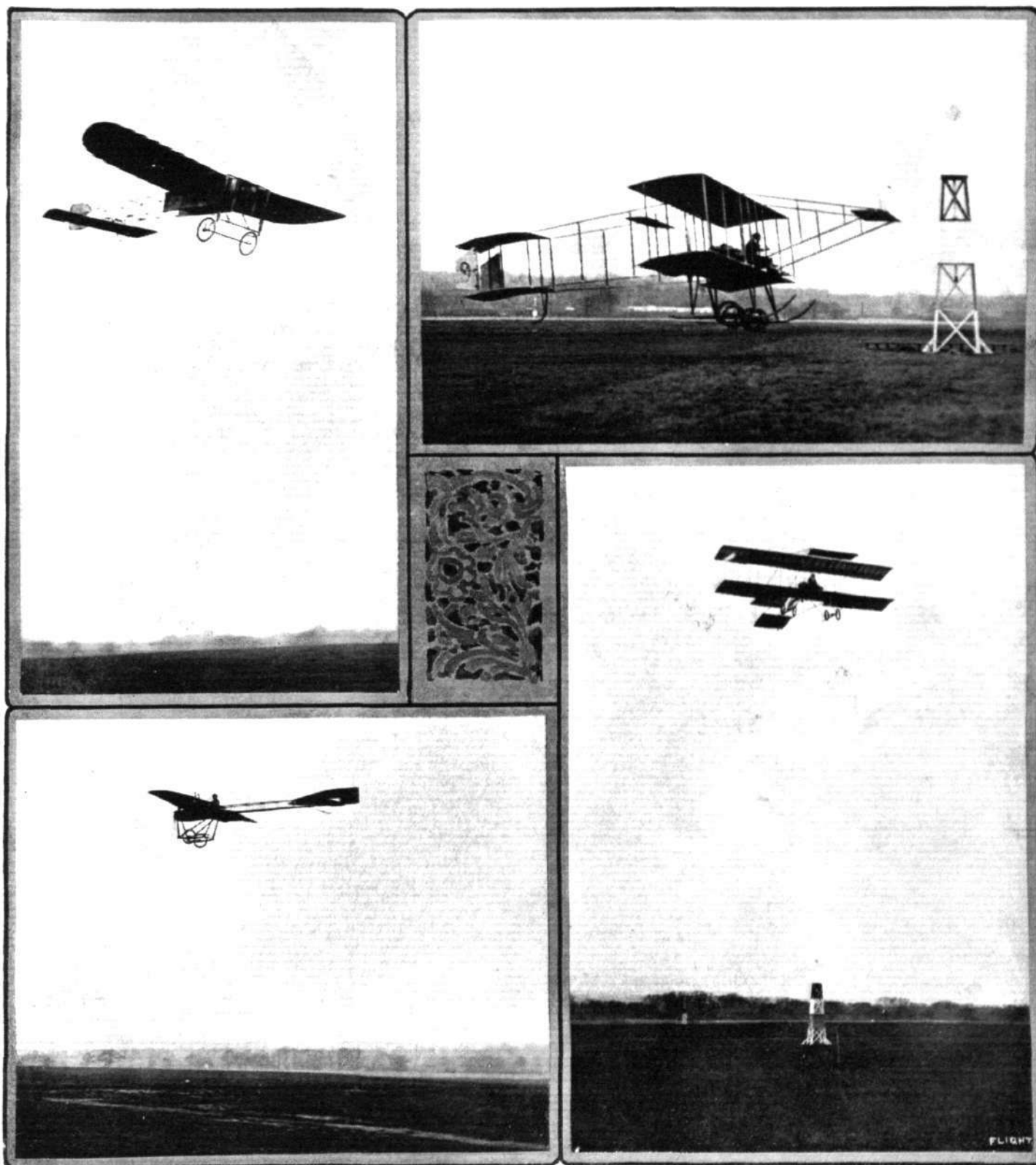
A fine piece of steering round a mark tower, at 67 miles per hour, by Mr. Grahame-White on his Nieuport monoplane.

startling left-hand turn with terrific banking and descended in an almost vertical *vol piqué*. For some few moments apprehension was rife as to whether he still had control over the machine, and great was the relief when he flattened the monoplane out and landed. His coming to earth was a signal for renewed applause. Another interval followed of about an hour, during which the wind did not abate in the slightest. Shortly before tea Lewis Turner flew the Farman round for one circuit. He was tossed about in a manner rather fearsome to watch, but, all credit to him, he stuck to his job and brought the machine safely to land none the worse for the horrible buffeting he had received. Later on in the evening Hamel, on Sopwith's 70-h.p. two-seater Gnome-

Blériot, started off for the altitude contest. On this machine, owing to its greater speed, the wind did not seem to have so much effect. Higher and higher he rose until he had attained the 6,000 ft. level. At this altitude the wind must have been blowing a veritable gale, for the machine, which in still air can do 65 miles an hour, was literally being blown backwards and away from the aerodrome. Even in his *vol plané* from that height he did not seem to make any headway towards the aerodrome until he had descended some considerable distance. This flight lasted 26 minutes.

Saturday, April 6th.

The first out on Saturday was Ewen, who, taxi-ing his machine from its shed at the far side of the ground to the enclosures, decided to attempt a circuit. All along the front of the enclosures did he fly at a height of about 20 ft., but as the wind was really too bad he came down, as his machine was not powerful enough to combat the gusts. From then until half-past four there was a long interval, relieved only by daylight fireworks. Then Hamel's machine was pushed to the far side of the ground by his mechanics, so as to get a



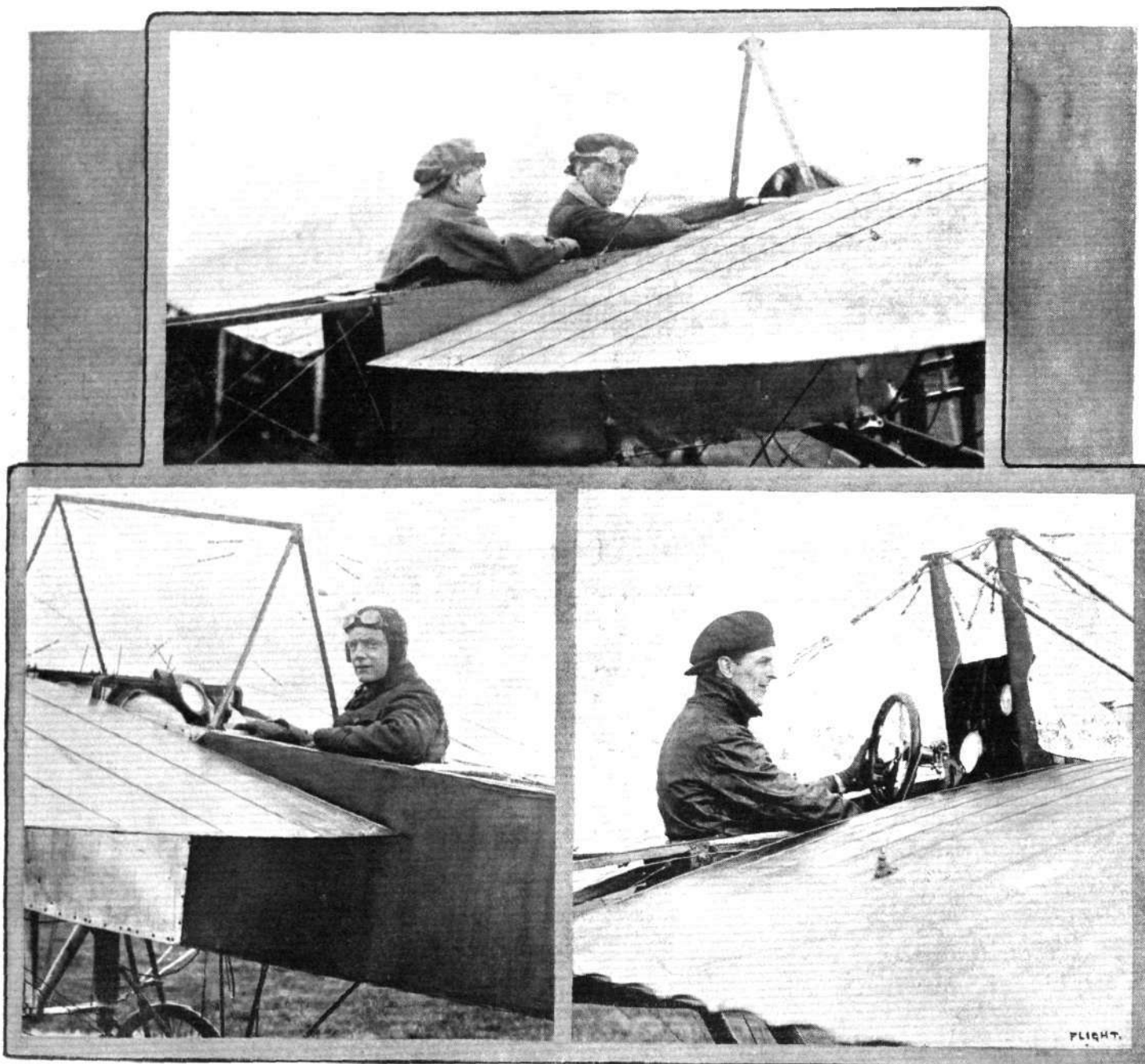
IN THE AIR DURING THE EASTER FLYING MEET AT HENDON.—(1) Mr. B. C. Hucks on his 50-h.p. Blériot; (2) Mr. Graham-White landing on his Farman after a flight; (3) Mr. W. H. Ewen on his Deperdussin; and (4) Mr. Lewis Turner giving an exhibition on the Henry Farman.

run into the eye of the wind. He quickly rose, rocking the while, to a height of 1,000 ft., where in spite of the wind he carried out sharp bank turns and similar manoeuvres peculiar to the first-rate exhibition flyer. Several further exhibitions did he give during the afternoon. The closing flight of the day was one by Grahame-White on his 70-h.p. Nieuport, and the speed that this machine showed over the ones that the spectators had seen flying during the afternoon was most marked.

Sunday, April 7th.

Throughout the previous night the wind had been steadily dropping, and at dawn not a breath of air was noticeable. This, to

Grahame-White's that had been resuscitated from the remains of the machine that Drexel smashed at the Parliamentary Demonstration last year. He flew around for about eight minutes at a height of 120 feet and made quite a good landing. On three further occasions during the early morning did he fly, the third time taking a barograph with him and getting right up to 850 metres, at which height he flew through two sets of clouds, becoming temporarily invisible to those watching his flight from the ground. Hucks undoubtedly has the making of a very excellent pilot, for at his fifth attempt on an Anzani-Blériot he kept the machine up, with its motor, it was one of the old ones, threatening to peter out any



SOME OF THE HENDON PILOTS.—At the top Mr. T. O. M. Sopwith and Mr. Sassoon on Mr. Sopwith's 70-h.p. Blériot. Below (left), Mr. B. C. Hucks on the 50-h.p. Blériot, and on the right Mr. W. H. Ewen on his Deperdussin.

way the least of it, was somewhat annoying, in view of the fact that no definite programme of events had been fixed for this day. The first out in the morning was Prensiell, on Hamel's old Gnome-Blériot, in which he has had installed one of the new 35-h.p. Y-type Anzani motors. For some unknown reason Prensiell flew right at a pylon, which, although a very substantial structure of wood, and resting on a wide base, he knocked right over. His machine, as may be imagined, was considerably damaged, although neither himself nor his motor suffered a whit from the unfortunate accident. Hucks, who a few days previously had been getting his initial experience of the Blériot on one of Grahame-White's school machines, came out at about a quarter to seven on a Gnome-Blériot of

moment, for three circuits. His spiral *vol plané* on the Gnome-Blériot from 2,500 feet was further confirmation of his ability. Turner on the Farman-type biplane with Curtiss-type ailerons, and Ewen on his Deperdussin, were also carrying out lengthy flights.

Some time after breakfast Turner took out the old Farman, and flew round the course at a low altitude, banking his corners terrifically at the pylons. While we were wondering if it were safe to stand a Farman on end so much, we heard cries of "Here comes Cody," and, looking towards the horizon, saw a biplane approaching at about 1,500 feet level. There were more cries of "No it isn't. It's Sopwith on the Burgess-Wright."

As a matter of fact neither were correct for it was Raynham on

Sopwith's Wright, who landed after doing a spin around the course and treating the few present to a selection of banked turns. Meanwhile Lewis Turner, on the Farman, had changed his tactics and was amusing himself by doing "switchbacks" in the manner originated by Grahame-White some time since.

Then Sopwith took his seat in the Burgess-Wright and with Mr. Sassoon by his side as passenger flew off for a few circuits.

Spectators were immensely pleased with his delightfully easy handling of the machine. His banks were wonderful. Descending, he flew along the front of the enclosures at about two feet from the ground straight at the Ewen school Blériot. The two mechanics attending that machine ducked for their very lives. They might have saved themselves the trouble, for he simply hopped over the monoplane, down the other side, and continued his grass-clipping unconcernedly. Next off was Hucks on the Gnome-Blériot. The wind had risen meanwhile, and was blowing about 10 miles per hour. He circled round for a quarter of an hour, banking his turns well.

Sunday afternoon was the best day of the meeting, and spectators who took advantage of the good weather conditions to visit the aerodrome were treated to about as good an entertainment of flying as would be possible under any circumstances. Those flying, Messrs. Grahame-White, Sopwith, Hucks, Allen, Hamel, Lewis Turner, Ewen, and Raynham, and later Mrs. Stocks, are undoubtedly the best exponents of the art in England, and their flying was well up to their usual standard. Of different machines in the air there was a good representative collection. Among the monoplanes were the Nieuport, several Gnome-Blériots, and a Deperdussin, and of biplanes two Farman and Sopwith's Burgess-Wright. The wind averaging 10 miles per hour, with occasional gusts up to 15 miles per hour, did not cause the competitors any trouble. Grahame-White was first out doing a speed test round the pylone course, cutting the corners very sharp and banking well accordingly. Five laps he did at an average speed of 65 miles per hour. Shortly afterwards Sopwith ascended with a passenger on his dual control Burgess-Wright, and gave an exhibition, showing in his turns how extreme a banking is possible on a Wright biplane. Throughout the afternoon Hucks, Allen and Hamel all gave excellent demonstrations of their handling of Gnome-Blériots. On descending from his Wright, Sopwith took up several passengers in succession on his 70-h.p. two-seater Blériot, a machine which seemed to have an even greater turn of speed than on the many occasions when we have seen it in flight at Brooklands, this possibly being due to the fact that a Levassor propeller has been fitted. So numerous were the



Mrs. C. Stocks, the clever aviatress who was "amongst those" who flew at Hendon during the Easter Meeting.

flights that it would be impossible to detail each one, or on one occasion there were no fewer than four Blériots and a Deperdussin in the air at the same time. Both Mr. Grahame-White and Lewis Turner were extremely busy later on in the afternoon in giving passenger flights to several spectators. Amongst those having the pleasure of a trip with Mr. Grahame-White was Miss Margery Maude. Ewen, who had flown repeatedly on his 28-h.p. Deperdussin during the afternoon, made a short cross-country trip, passing over Harrow at a height of about 500 ft. Here the weather conditions were apparently not as good as at the aerodrome, for on his return, he told us after the flight that he had such a kick on his right wing that it took his control wheel right out of his hands for the moment, knocked the glass out of his engine revolution indicator, and broke the needle of his altimeter off short. At about half-past four Sopwith decided that his Burgess-Wright must return to Brooklands, in view of the possibility of it being required for the flying there on Easter Monday. It was flown back by Raynham, who took a passenger with him. He made two circuits to attain altitude, and left in the Brooklands direction at a height of about 500 ft., arriving at his destination some 45 minutes afterwards.

Mr. Grahame-White, on the Farman, took up with him Capt. Tyrer, the aerodrome manager, who is an experienced shot, and who fired at inflated paper figures liberated from firework bombs. Out of the half a dozen or so shots he made, only his first took effect. Undoubtedly the experiment would have met with much greater success had Capt. Tyrer been accommodated on the machine in a better place than behind the pilot, from which position he had to exercise the utmost care in taking his aim, in order to avoid carrying away any of the important wires operating the control or trussing the aeroplane structure. He proposes on future occasions to fit a type of hammock below the lower plane, just under the pilot's seat, so that lying full length he may not be so encumbered. Mrs. Stocks shortly afterwards made quite a nice little flight round the aerodrome for several circuits and was afterwards taken up as a passenger by Grahame-White. The closing flight of the day was one by Hamel, who ascended some 4,000 ft. and came down by a spiral *vol plané* that would almost have drawn cheers from a mute.

Monday, April 8th.

The wind on Easter Monday was something colossal, having risen from about 8 o'clock the previous evening, and been steadily increasing in force throughout the night. Across the fields, on the foot-path leading from the bottom of Hendon Hill to the aerodrome gates, the wind was so strong that on foot it was difficult to make any headway against it. Hats went spinning in all directions. In the aerodrome the strength of the wind can well be judged by the fact that a tent hangar had its roof ripped off, and that one



The Lord Mayor introducing Mr. Grahame-White to the Lady Mayoress at the Hendon Flying Meeting.

of the mark posts, quite a massive structure of wood, had been toppled completely over. In spite of the very unsuitable conditions all roads leading to the aerodrome were black with visitors, and although people intending to enter the aerodrome were warned that under no circumstance could flight be guaranteed, the enclosures were soon comfortably filled. And Grahame-White did not mean to disappoint them. At half past three it was announced from the Judges' box that he would "parade" a Farman biplane. The machine in question was brought out with Grahame-White in the pilot's seat and held down to the ground by two mechanics at each wing-tip and two near the skids. Even at that, the machine threatened to blow over. To run the machine over the ground against the wind the engine had to be kept going all out the whole time, and even then the machine did not exceed the running pace of the mechanics who kept it from leaving the ground. In one of these runs up the aerodrome it really seemed as if the machine lifted all seven off the ground for a moment. After parading the machine before the enclosures in order to give the public an opportunity of grasping the nature of an aeroplane at close quarters, Grahame-White decided to attempt a short flight. With his chief engineers Carr and Law standing one on each skid, he started up into the wind, and flew for about 200 yards at a height of 10 ft. Even for this short distance he seemed to be in the air for quite one minute, so the speed of the wind can be readily estimated. Two more flights of the same order did he make. At the termination of his third the wind caught him, and made him bump rather heavily from about 10 ft., an incident which made it evident that there is more strength in the Farman chassis than is at first apparent. As regards this section of the machine the only replacement necessary was one rubber shock-absorber. In his exertions to keep the machine on an even keel, Grahame-White had smashed up the pilot's seat and considerably bent his foot rudder-bar. An interval was called while these were being replaced, and then, with Lewis Turner sitting on the *cellule* to his right, and Carr to his left, he taxied the machine over to the far side of the ground, in order to get in a longer flight. He turned up into the wind and got off the ground. When he was about 10 ft. up, a gust caught him under the left side of the *cellule*, and no amount of manipulation of the levers could bring the machine back to the horizontal. It slipped down on to its right tip, and on to the right hand corner of the elevator, and blew right over. Grahame-White and Turner jumped clear, and the machine passed right over their heads. Carr being on the side that was rising, hung on for his life and went right over with the machine, eventually crawling out from underneath the wreckage, his face



M. Salmet and Mr. Sopwith discussing prospects of flying in the gale at Hendon Flying Meeting.

wreathed in smiles. After all, there was really not much danger in the incident, for the wind was about equal to the flying speed of the machine, and its speed relative to the ground at that moment was practically nil. Of the three, Grahame-White was the only one who suffered anything apart from stiffness, and that only to the extent of a sprained ankle, from which he had recovered the following day.



AFTER THE MISHAP IN THE GALE TO GRAHAME-WHITE'S BIPLANE AT HENDON ON EASTER MONDAY.—On the top of the overturned machine are seen Messrs. Grahame-White, Lewis Turner, and Hamel.

HEAD RESISTANCE AND WING STRESSES.

THIS week we publish below further views upon the important report made by M. Blériot to the French Government.

Mr. Archibald R. Low:—

Monsieur Blériot's conclusion that the upper stay wires of monoplane wings should have nearly as large a factor of safety as the lower stay wires is probably correct. From the reasoning by which it is attained I must dissent.

There are two main propositions in the argument. First, that a pressure may be exerted on the wires equal to or greater than the normal sustentation, but in the opposite direction, during the ordinary manoeuvre of a changing from horizontal flight to a glide. Second, that it is needless to carry the factors of safety higher than five or six, because when greater stresses than five or six times the normal are imposed the resultant forces of inertia on the pilot's organs will be as dangerous as the collapse of the machine and the subsequent shock of meeting the earth.

To the first proposition it may be objected that an instantaneous change of direction, such as is shown in M. Blériot's diagram, requires an impulsive couple to be applied to the machine. But such a couple cannot be produced either by an eddy in the air or by the elevator, as from these sources we can only look for couples of strictly finite value.

If, however, the pilot, or a gust of wind, did produce an angular velocity of such magnitude, and a curvature in the path of the centre of gravity so great that the centrifugal force along the radius of curvature was greater than the force of gravity, then a downward pressure would be exercised on the wings.

The front part of the machine would fall *faster than a stone*, and the whole apparatus would probably tumble head over heels like a tumbler pigeon, while the pilot, who would fall *only as fast as a stone*, would be left behind in the air, unless held down by a safety belt.

If the pilot (or the weather) is so bad as to make this result probable he had much better stay on the ground.

If such an accident does happen, then once the machine is upside down, the full stresses will come on the wings in the reverse direction, and it depends on the ability of the upper stay-wires to resist these stresses whether the machine collapses in the air, or holds together and reaches the ground by a series of irregular glides, possibly righting itself in the process.

There is actually the case on record of Reynold's biplane, which was upset by a violent eddy, and which did bring its pilot to the ground safely by a series of irregular glides.

Finally, it must be observed that the lower and upper stay-wires are strained pretty taut against each other.

If the lower wires are much heavier than the upper ones, the stresses required to keep the heavy lower stays taut are quite sufficient to stretch the light upper wires.

The resultant sloppiness is probably cured, by the average mechanic, by tightening up the upper wires which may thus be drawn out and crystallised to the point of collapse before the machine leaves the ground. A hard landing, and much more a serious accident, might readily snap off the wires thus weakened, without the breaking of the wires being in any way directly responsible for the accident.

With regard to the second proposition will you permit me to amend slightly your translation of the last paragraphs of M. Blériot's report.

These should read (translated somewhat freely):—

"There is therefore occasion for avoiding exaggerated factors of safety.

"Their scale of magnitude should be fixed with reference to the resisting powers of the human frame, for the pilots are subject to impulsive forces of inertia which are transmitted through their whole bodies, and whose maximum possible intensity is proportional to the numerical value of the factors of safety, at least in the case of rigid machines with which alone we are concerned in actual practice."

This implies that a safety factor of five is required to meet actual working stresses of five times the normal stresses of steady flying; and, as already stated, that after such a point is reached, the inertia stresses are so high that the pilot receives *fatal* injuries internally, and is therefore indifferent to the collapse of the machine.

But in the practise of aviation general stresses of double the normal stresses must be considered extremely rare, although local increases of much more than double may reasonably be anticipated.

And a factor of safety is usually defined as the ratio of the ultimate breaking stress of the member considered to its maximum normal load.

Such a factor of safety has to account for the stresses arising from internal strains, for possible defects in the material, for vibration and its weakening effect on materials, as well as for general increases of stresses in gusts of wind.

We have not yet heard of internal injuries sustained by pilots excepting the passing troubles of *mal de mer*.

And all machines, and the eddies of air which buffet them, are highly elastic, so that even if the machine meets a gust of air travelling at its own speed (a very severe condition) the stresses are increased but four times even according to the very limited theory that the force is applied instantaneously to all parts of the machine. And actually they are increased much less than four times, on account of the give of the machine and the elasticity of the air.

M. Blériot may not really expose his true views on construction in his interesting report, but those he does express are certainly exaggerated and misleading.

Mr. A. V. Roe:—

I certainly think it is a wise precaution to pay more attention to the upper bracing than has been usual in many cases, but it seems hard in spite of M. Blériot's explanation to conceive a pilot making a sufficiently sudden descent to cause excessive down thrust on wings, and yet it is possible.

The pilot can easily feel when he makes a too sudden descent, for if the air acts as a brake on the upper side of wings, there will be a tendency to throw the pilot forward from his seat, owing to the centrifugal action and checking of the speed.

However, in future, pilots will be more careful when starting their *vol planés*, or when they require to make a sudden descent.

This knowledge, together with a larger factor of safety on the upper bracing, should render any more accidents of this nature unlikely.

Mr. W. O. Manning:—

I am in agreement with M. Blériot as to the possibility of getting a pressure on the top-side of monoplane wings, and have no doubt that this occasionally occurs in practice, especially if the monoplane is fast, and is fitted with controls so powerful as to enable the machine to be very suddenly dived. It is also certain that this top pressure would be considerably increased if a gust of wind struck the machine full in front at the critical moment.

But at the same time, it is not easy to see how this pressure can amount to very much, as it is known that when the ordinary curved plane is placed at such a great negative angle that one gets the usual direction of the lift reversed, that this lift is very small indeed, and certainly as a maximum could hardly amount to as much as half the weight of the machine.

I have discussed this matter with several well-known monoplane pilots, and they all assure me that they have never found themselves being violently forced upwards out of their seats when diving, which effect would certainly occur if the top pressure were considerable.

Generally speaking, it seems to me quite impossible that a serious pressure can ever occur on the top side of monoplane wings, and I therefore consider that this theory is insufficient to explain the too numerous cases of failure of these wings during flight.

Mr. Frederic Strickland:—

It has always appeared to me that, judging from purely theoretical grounds, monoplane wings were weak in certain directions, especially horizontally.

With the usual arrangement of trussing there is provision for taking the vertical load, but very little for taking the horizontal one. True in most cases the truss wires lead forward somewhat, and if it is assumed that the only stresses on the wing of an aeroplane are those due to air pressure at right angles to the surface, this may be sufficient.

This assumption does not, however, seem justified. The head resistance and the weight borne by the planes are not necessarily proportionate to each other. Hence, if the wings are temporarily relieved of the weight, there is no trussing to prevent the wings folding back, and they may do so, especially if the speed is at the same time high, as at the end of a steep *vol plané*.

The possibility of failure in this direction was pointed out in *Engineering* some two years ago, and repeated several times since. Whether the various failures are due to this it is impossible to tell accurately, but there seems some reason to think so. In the first place high speed rather than excessive loading appears to have generally been the cause of breakage; in the second, the only photo I have seen of a wing failing gives the impression of its folding back more than up; and in the third, there is a record in *FLIGHT* of a wing failing from horizontal weakness when so near the ground that a safe landing was effected. In this case there was, therefore, definite proof that the wing was too weak horizontally, though strong enough vertically, and had the failure occurred when far from the ground the aviator would have been killed.

With regard to M. Blériot's letter, it is, of course, quite possible that when making a sudden dive the pressure is momentarily above the

wings in place of below. It is also possible to calculate what radius of the vertical turn is necessary to produce this and to calculate the amount of pressure for any radius of turn and speed. Any failure from this course would, however, take place at the beginning of a *vol plané* and not at the end as has certainly been the case with several failures.

A point of great importance in his letter is the question of what is meant by the "factor of safety of five" allowed for the main truss wires. If it means that their breaking strength (as per testing machine) is only five times the static load due to the weight of the machine, &c., I think most engineers would certainly think it very low and would expect accidents.

I may point out also that single ribbon and wire such as used for the trusses of aeroplanes, have been found too unreliable for use in racing sailing boats and have been abandoned in favour of wire rope. It does not necessarily follow that they are unsuitable for aeroplanes but the point is worth considering.

Arguing solely from theoretical considerations I would suggest :—

1. Providing the wings with substantial fore stays independent of the main truss wires.

2. Ascertaining by experiment the shortest practicable radius of turn at the beginning and end of a *vol plané*, and providing truss wires to take the centrifugal force caused by such turns with the usual factors of safety. The pressures on the wings are easily calculable, as accurately as such other stresses in structures (*vide* "Monoplanes and Biplanes," published by Munn and Co., and *Engineering*, for January 12th, 1912).

It also seems to me that it would restore public confidence greatly if persons who allow a good factor of safety would publish their calculations.

"Monoplanes and Biplanes" is a book written by Grover Cleveland Loening, published by Munn and Co., New York, and Sampson, Low, Marston and Co., Ltd., London.



AERONAUTICAL SOCIETY OF GREAT BRITAIN.

ABBREVIATED FORECAST OF MR. T. W. K. CLARKE'S PAPER ON "AUTOMATIC STABILITY" (WITH SPECIAL REFERENCE TO THE CLARKE-JOHNSON GYROSCOPIC CONTROL) WHICH WILL BE READ AND DISCUSSED AT THE ROYAL SOCIETY OF ARTS, MONDAY, APRIL 15th, at 8.30 p.m.

PROF. JOHN PERRY, F.R.S., IN THE CHAIR.

1. There are three systems of stabilising aeroplanes :—

a. Natural. b. Personal. c. Automatic.

2. Natural stability is inherent in the form of the machine.

A well-known example of this principle is the dihedral angle. The characteristic of this system is that the machine tends to maintain a constant attitude to the relative wind, consequently if the wind veers excessively the machine becomes unsteady in trying to maintain its balance.

3. Personal control, by the operation of balancing planes, wing warping, &c., is the system commonly in use to-day. Its limitations are those incidental to the human factor in air-controlling systems, which it is the purpose of natural and automatic stability to as far as possible remove.

4. Automatic control utilises the same balancing organs as are ordinarily controlled by human agency, but brings them automatically into action by mechanical means.

5. It is with the last mentioned system that this paper deals in particular.

6. A point that is immediately obvious from a study of the principle of automatic control is that the instrument applied to this purpose must have an inherent "sense of direction."

7. This narrows the investigation to three devices (i) the pendulum weight, which possesses the inherent directive effort of gravity; (ii) the compass, which is directed by the earth's magnetism; (iii) the gyroscope, which is directed by its rotational momentum.

8. The objection to the pendulum weight is its natural oscillation, which is likely to make the machine unsteady while recovering from a disturbance, and also to make the control unreliable when it is sensitively set.

9. The objection to the compass is its weakness as a force for operating practical mechanisms.

10. With the properties of the gyroscope it is the purpose of this paper to deal.

11. It is self-evident that direct control of the balancing organs by the stabilising instrument involves a very heavy apparatus and tends to reduce sensitiveness, consequently the principle of the relay must be accepted as fundamental, whatever the nature of the instrument.

12. Assured of adequate sensitiveness, it is natural to conclude that the most satisfactory way of bringing the instrument into operation is to make it subject to the tilting of the machine.

13. This principle has the great advantage of ensuring that the conditions to be corrected are those actually disturbing the machine, whereas if the instrument is controlled by a small supplementary wind vane the conditions that it attempts to correct may not quite

be the same as those actually disturbing the machine, and a lack of harmony in its operation is the result.

14. The following is a description of an apparatus embodying the chief points enumerated above. It is a gyroscopic control and is brought into operation by the tilting of the machine. It regulates a relay mechanism, whereby the balancing organs are actually manipulated. It is light, compact, and can be sensitively adjusted without becoming unreliable.

15. The gyroscope is four inches in diameter and consists of the external rotor of a small electric motor that is driven by a 10-volt battery.

16. Its axis of rotation is horizontally across the line of flight and its supporting frame is pivoted on a vertical axis.

17. All students are familiar with the fact that tilting the spinning axis of a gyroscope in one plane causes a reactionary "kick" precession in a plane at right angles thereto.

18. If, therefore, the aeroplane tilts laterally, the gyroscope will swing round on its vertical pivots in consequence.

19. Such action on the part of this gyroscope operates a switch that energises a magnetic clutch normally running free on a rotating shaft that is driven by the engine of the aeroplane.

20. There are two such clutches, either of which comes into operation according to the direction in which the gyroscope swings, which direction is determined by the direction of tilt on the part of the aeroplane.

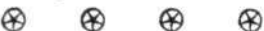
21. When one of the clutches is engaged it throws the mechanism into gear by means of which the engine power is utilised for operating the balancing planes and thus restoring equilibrium.

22. There is an important time factor in the sensitiveness of gyroscopic control inasmuch as the precessional movement towards the switch contacts is proportional to the speed of tilt, that is to say a sudden disturbance of the machine's equilibrium produces a correspondingly sudden switching on of the controlling apparatus.

23. The gyroscope as a whole is mounted on a hinged board that is normally in the same plane as the wings of the machine, but is so interconnected with the steering gear as to cause the board to be tilted while steering. This enables the machine to be banked for turning, whereas otherwise the automatic control would maintain an even keel during this evolution and thus tend to induce skidding.

24. Electric current is fed to the gyroscope by contacts in the bottom pivot bearing.

25. The controlling mechanism for operating the balancers is so arranged that they can be hand-controlled independently. The influence of such hand control is additional to that caused by the gyroscope, that is to say, if both happen to operate together then the result produced is correspondingly magnified.



Belgium Proposes an International Contest.

THE Belgian Aero Club has suggested the holding, in about two months' time, of an International competition, in which Germany, Belgium, France, and Great Britain should be represented by teams consisting of a monoplane and a biplane. It is proposed that the contest should be over an out-and-home course of 500 kiloms., starting from the neighbourhood of Brussels, and the prizes to be 50,000 francs, 30,000 francs, and 20,000 francs respectively for the teams placed first, second, and third. The winning team would be the one whose aggregate time was the best.

Pekin to Paris by Aeroplane.

THE *Matin*, which surprised the world with the audacity of its proposal to organise a motor car race from Peking to Paris in 1907, and which, as will be remembered, was successfully carried through, has now definitely announced that it will organise a flying race between the same two capitals. No details have been published yet, but our contemporary announces that the prize will be commensurate with the time, trouble and expense involved in flying over such a course of 7,500 miles. Mr. Hamel has expressed his intention of taking part in the race.

AIR EDDIES.

MR. HOLT THOMAS, who, as recorded in these pages last week, has taken over the sole agency for Henry and Maurice Farman aeroplanes and hydro-aeroplanes for England, has engaged four hangars at Hendon, which ground he intends to make his chief flying centre. It is quite on the *tapis* that before long we shall have the opportunity of again seeing Renaux flying at Hendon, for I understand that arrangements are being made for that well-known French pilot to come over to this side of the Channel for the purpose of demonstrating these well-known machines.

Besides Renaux, there is more than a chance of seeing M. Caudron flying at Hendon during the next week or so. The English agency for Caudron aeroplanes has, as is mentioned elsewhere, been acquired by Mr. W. H. Ewen, who should really have delivery of his first biplane by the time these lines appear. It is M. Caudron's plan to come over with his machine and personally carry out preliminary demonstrations.

Charles Hubert is rather happy that he has managed to get excused from doing his conscription service in France on account of the weakness that he yet feels in his legs. However, he says, "You will be surprised to see how easily I walk now without much limping; but even this limping business will gradually get less, and in a few months no one, I think, will ever know that I had such a bad spill in September last."

The many friends of Mr. Furbank, one of the Flanders pupils at Brooklands, who flew under the name of Mr. "Lark," will be glad to hear that he is steadily improving from the rather bad accident that he sustained on the 16th of last month.

Salmet, whose wonderful flight from London to Paris and back will long be remembered in the annals of aviation, intends, when he gets delivery of the new monoplane which M. Blériot has promised him, and when the weather gets more favourable for long cross-country flying, to attempt to fly from London to Paris and on to Berlin in one day.

Quite surprising progress did Hucks and Lewis Turner make in tackling the Anzani-Blériot. Turner, who had never before been on a monoplane, at his first attempt made two circuits. On Wednesday of last week, Hucks got down to the aerodrome early, and after twiddling violently, as I predicted a week or two ago, made quite a nice straight flight. Once in the air, he had full control, but governing such a low-powered machine on the ground with such a flexible chassis as a Blériot is endowed with, is quite a different matter. However, during the morning he got from straights to circuits, and after breakfast kept the little machine in the air for five circuits, in spite of a failing engine. Turner, not to be outdone, then went ahead and made six circuits on the same machine, but then, of course, he is much lighter than Hucks.

Sippe is getting on very nicely with the experiments with Commander Schwann's Avro hydro-biplane, tests of which he is superintending at Barrow. On Tuesday of last week he had the machine out and made several short flights. The machine has now been fitted with floats of Duralumin at Messrs. Vickers' works. Sippe's chief trouble seems to be to know how to avoid the propeller becoming chipped through contact with the spray thrown up. The ends of the propeller have been bound, but this precaution is not apparently quite satisfactory.

The most closely contested competition during the coming season promises to be the *Daily Mail* circuit of London, which provides a comfortable 120 miles circuit round the Metropolis. The course has not yet been decided but will probably lie, starting from Hendon, over Wembley Park, Ealing, over Brentford to Wimbledon; thence *via* Streatham and Tooting to the Crystal Palace. From this point, passing Shooter's Hill, the Thames will be crossed somewhere *via* Ilford, and a return made *via* Wanstead and Tottenham—quite a comfortable little jaunt for one day's flying. In addition to offering a trophy the *Daily Mail* are putting up money prizes.

Chatting to a friend the other day about the weird notions as regards the general outline of an aeroplane that most book illustrators seem to possess, brought back to memory a most amusing

incident that happened when I was connected with a firm that amongst their many activities, undertook the supply of parts and accessories to the amateur builder. A gentleman called one day with a view to obtaining a pair of propellers for a machine he was then constructing. Of such moment did he deem his invention, and such secrecy did he mean to maintain regarding its details, that it was with difficulty that I managed to wheedle from him the necessary data for the propeller man to work on. To commence with, he explained that as he had had little experience in aviation—he was a steam laundry proprietor by calling—perhaps the few details he purposed giving would arouse some small amount of incredulity. However, he assured me that the design was the result more of an inspiration than of actual study, and that a day would dawn when its utility would be universally recognised.

Then followed preliminary details. The speed was to be anything between 60 and 120 miles an hour, the weight, all on, 500 lbs., for his motor he intended to use a 2-h.p. motor cycle engine, and the clearance from the propeller hub to the ground, 20 inches. I began to be interested, and urging for further details he, in confidence, sketched me a rough outline of the machine. Enquiring how he intended getting 120 miles an hour out of a 2-h.p. engine, he explained that, as the machine was equipped with *six powers*, that would be quite easy of attainment. He then recapitulated his "powers."

His first was his aeroplane, a cambered surface some 10 ft. by 6 ft., arranged above the head of the pilot like an awning. His second power was a gas-bag, 6 ft. long by 3 ft. in diameter, which he reckoned on being quite sufficient to lift the whole machine. I hereupon pointed out that the hydrogen contained by a gas-bag that size would lift just over 3 lbs., and that, estimating the weight of the envelope and the internal framework necessary to keep it rigid in a relative wind of 120 miles an hour, at 5 lbs., he would be at a net loss of about 2 lbs. over the gas-bag. At this juncture he glared at me with an evil eye, but nothing daunted, proceeded to tell me of the rest of his powers.

His third were extensions of the main aeroplane which flapped. His fourth power was his motor of 2-h.p. as explained previously, his fifth were his twin propellers, and for his sixth power he reckoned to do a little bit on his own account by pedalling. From this data I plunged into calculations, and estimated that two propellers 36 ins. in diameter, chain driven in opposite directions, would just be about his mark. With so many "powers" crammed on to one small machine, he figured that wild horses could not prevent it attaining immediate and glorious success.

There is rather an amusing sequel to this anecdote. We had just arrived at this stage, when the office boy entered and informed me that Mr. —, aeronautical engineer, would like to know if he could have the pleasure of supplying me with anything. I locked the steam-laundry proprietor in my room, and went out to see the aeronautical engineer. Yes, he could supply me with something—he could supply a pair of propellers. I gave him a most complete specification. They were to be of a certain pitch, certain diameter, of five laminations of different kinds of walnut, and the blades to be silk-covered and varnished. They were to resemble Chauvières, and they were to revolve in opposite directions and absorb 2-h.p. at 1,000 revs.

I thought the best idea would be for him to cut along back to his works, figure the whole thing out, and let me have an estimate by the following morning. This course he thought unnecessary. He scratched his head, looked wise, and, after a minute's pause said: "Hm—yes—let's see. What shall we say? Hm! I can let you know now. What! I'll do 'em for seven shillings the pair, if that'll suit you."

I closed with him, and went back to the inventor, whom I assured would get his propellers within a day or two. He left in very good spirits, minus a cheque. The propellers arrived three days afterwards; and quite a decent job they were, considering the work they were intended for. At any rate, I was very happy, for it provided me with an excellent morning's amusement. My firm made £4 13s. over the deal!

"OISEAU BLEU."

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Flying Ground, Eastchurch.

WITH most of the Naval aviators away on leave, after the strenuous work of the last few weeks, the Eastchurch Aerodrome was unusually quiet during the holidays.

On Tuesday, Commander Samson, R.N., put the new Short 100-h.p. tractor biplane, which had been constructed for Naval purposes, through her first trials. The machine was stated to be excellent in every way, showing remarkable climbing powers with a very flat gliding angle, although her construction is unusually strong and solid. During the flight Commander Samson attained an altitude of about 2,000 ft. The speed of the machine was estimated at 60 miles per hour.

In the afternoon Capt. Gerrard, R.M.L.I., and Lieut. Gregory, R.N., were also practising on the Naval School machines, although the wind was blowing strongly, flying over Sheerness together at an altitude of 1,000 ft., where they met with some very strong wind currents and had several vertical drops due to so-called air-pockets; otherwise, the machines were exceptionally steady, and their behaviour in gusty weather is inspiring great confidence in this type of machine.

On Saturday afternoon, Mr. Frank McClean and Professor Huntington were the only aviators flying, the former on his 70-h.p. Short tractor biplane, and the latter on his automatic stability machine of the early Dunne type. On both days the weather was very unsettled, Mr. McClean having a particularly rough time when flying near Harty Ferry on Sunday afternoon. Professor Huntington made several short flights at the height of some 30 or 40 ft. He has recently adopted the Short landing chassis to his machine, as being the most suitable he has found for landing on rough ground.

On Tuesday evening, Mr. Frank McClean was out on the 70-h.p. Tractor, flying in a considerable wind, which showed over 20 miles per hour on the wind recorder. By 7 p.m., however, the wind dropped to a calm, and later McClean took up two passengers, viz., Miss Marion Spicer and Mr. Lancelot Spicer, giving them a fine flight round the aerodrome at an altitude of about 200 ft.

Brooklands Aerodrome.

WEATHER conditions are not yet all that could be desired. On Tuesday last week only a little flying took place. Pizey on the Bristol biplane took up Mackworth, after which the pupil made some straight solo flights. Major Bannerman on the same machine flew a few circuits.

Raynham on the Burgess-Wright took up in turn Howard-Wright, Hedley, and a mechanic, while Sabelli performed a circuit or two on the Deperdussin *brevet* machine.

Wednesday was rather better. At the Bristol school Mackworth reached the circuit stage, making very nice turns. Fleming and Pizey were both out with pupils during the day. Gill, on the Deperdussin, put up a good flight at an altitude of some seventy feet, and should soon be ready to take his certificate. C. C. Turner

also on a Deperdussin, put in some rolling practice, his operations being brought to a finish through a wheel buckling owing to a sharp turn. About eleven o'clock Pixton turned up from Salisbury on a two-seater Bristol monoplane, with Lieut. Ashton as passenger. The journey occupied about an hour, the air being very bumpy in places. Soon after Sopwith left for Hendon on his 70-h.p. Gnome-engined Blériot, taking Hedley as passenger. He also found it a bit bumpy, but succeeded in reaching Hendon in 17 minutes. Fisher brought out the rebuilt Hanriot for a trial, and after an alteration had been made to the propeller flew for about five minutes. The machine handled very well, and showed much improvement in its climbing powers, rising at times almost like a Gnome-Blériot. Raynham on the Wright gave instructions to Howard-Wright, Hedley and Young.

Thursday was a bad day. In the early morning Porte was up for 15 minutes on the Deperdussin racer. Capt. Broke-Smith on a Bristol biplane made several circuits in a tricky wind, and Pizey and Fleming were doing solos. The next day was a blank, and on Saturday only Bristol machines were in the air, Pixton testing a new engine in the two-seater monoplane.

A vast improvement was experienced on Sunday, the morning being absolutely perfect for flying. Before breakfast 11 machines were out. One of the first was Spencer on the biplane he has constructed out of the old Macfie. The machine lifted at a remarkably low speed; in fact, the chief difficulty seemed to be to bring her down, as when the engine was switched off the tail immediately commenced to drop, causing the machine to rise. In spite of this, Spencer made a short trip outside the aerodrome at a fair height. When she is tuned up, this biplane should be an excellent school machine.

Another old friend out was the racing-type Farman, built by Blondeau some time back, and used by Lieut. Snowdon-Smith. Blondeau made a few circuits, and then Lieut. Hewlett took her for several straights, but found the engine missing too badly to continue. Fisher brought out the Flanders monoplane for the first time since Furbank's smash three weeks ago, and found everything all right, making a couple of flights of 5 and 10 minutes' duration.

At the Bristol school, Capt. Broke-Smith passed for his certificate in excellent style, flying with great steadiness and precision. Fielding and Mackworth both put up good long flights, and Capt. Allen on the Anzani-engined monoplane flew several circuits at a height of about 150 ft., showing great improvement in his landing. Chinery on the Deperdussin made a good flight with right and left hand turns, and Young on the Wright was out doing straight solo flights. Later on in the day, Raynham flew over to Hendon on the Wright, taking Hedley as passenger, and returning with Young as passenger in the evening. The outward trip occupied 24 mins., while the return journey took 52 mins. In the neighbourhood of Ealing the machine stood practically stationary for some minutes, and it was only by descending to a lower level that progress could be made.

In the afternoon, Pixton and Valentine were both out on their two-seater Bristol monoplanes tuning up. Both went outside the aerodrome, reaching a good height, and coming down in spiral *vol plans*. Fleming took out the biplane, but found it too bumpy for pupils. The Flanders monoplane, piloted by Fisher, was out again, testing a new propeller, and flying very strongly. Petre and Sabelli both took trips on the Deperdussin racer, and Percival was doing straights on his rebuilt biplane.

Eleven entries had been received for the cross-country handicap race to Chobham and back on Easter Monday, but owing to the high wind, which occasionally reached 60 miles an hour, the race had to be cancelled.

A new comer during the week was the Avro monoplane, which is now in course of erection. This is a highly original machine, about which there is bound to be great divergence of opinion. The rectangular fuselage is very deep, the pilot being completely enclosed, and obtaining his view of the outside world through a number of windows covered with non-inflammable celluloid. The motor, a 50-h.p. Viale, is supported in front outside the covering. The pilot climbs in through a trap-door in the roof, and in the case of an upside down landing makes an emergency exit through the side with a pair of wire cutters.

London Aerodrome, Colindale Avenue, Hendon.

Grahame-White School.—Weather conditions were more favourable on Tuesday, last week, and



THE NEW AVRO MILITARY PATTERN ENCLOSED-TYPE MACHINE.—View of the chassis and front part of the fuselage.

a fair day's work was possible. In the early morning Mr. Lewis Turner put in about an hour at circuits on biplane No. 2, flying at about 200 ft. in a 15-mile wind. Mr. C. Grahame-White was out on the same machine in the afternoon, giving exhibition flights and afterwards taking up three lady passengers.

Wednesday was a perfect flying day, and the school was busy from early morning till dusk, Mr. Hucks opening the day's work on monoplane No. 4, doing straights, circuits and figures of eight. Mr. Lewis Turner on biplane No. 2 at circuits, with Mr. Morris and Mr. Roupell (two new pupils) in the passenger seat in turn, afterwards doing a solo flight over the Welsh Harp and back and then up with Mr. Roupell again. Mr. Gates on same machine was doing several circuits; Messrs. Mantou, Morris and Major Liles all rolling on biplane No. 3. In the afternoon Mr. Lewis Turner on monoplane No. 4 was doing circuits, afterwards returning to biplane No. 2 and making eight passenger flights before turning the machine over to Mrs. Stocks, who flew several circuits in her usual professional style. This was her first appearance after a three months' tour abroad in which she has been indulging since obtaining her *brevet*. During the morning Mr. Sopwith had flown over from Brooklands on his 70-h.p. Blériot, and during the afternoon made two flights with a passenger, banking wonderfully and executing magnificent spiral *vol planés*. Mr. Grahame-White also had his 70-h.p. Nieuport brought out, and made a 15-minutes exhibition flight, flying very low and banking in his usual inimitable style, afterwards making a flight over the surrounding country and landing *en vol plané* in perfect fashion; afterwards he was out on biplane No. 2, with passenger, flying out over the Edgware road; Mr. Lewis Turner then took up one more passenger before turning the machine over to Mr. Biard, who finished the day's work with several circuits. Friday, Saturday, Sunday and Monday's work during the Easter meeting is dealt with elsewhere in this issue.

Blériot School.—Messrs. Tremlett and Pothet were on Tuesday last week both doing circuits, whilst Messrs. Aubert and Clappen confined themselves to making straights across ground.

Wednesday was a very good day for pupils, and seven of the school were very hard at work practising; the palm for hard work during the day having to be awarded to M. Aubert, who put in no fewer than 15 straights. Messrs. Tremlett and Pothet, who are shaping very well, were doing circuits in good style, whilst Messrs. Welburn, Thomsen, Teulade and Clappen were all practising straights. The remainder of the week no school work was possible owing to the inclement weather.

W. H. Ewen School.—In spite of the unfavourable weather, a fair amount of school work is being put in. On Wednesday last week ideal conditions were experienced, and the pupils at the school were busy from morning till night, all showing splendid results, both rolling and flying. On Sunday, before the exhibition flying at the aerodrome commenced, the school put in some good practice, practically all the pupils being out in force and getting some work in. Again, on Tuesday, the wind dropped about six o'clock, and the pupils were out until dark, when Lieuts. Pennycuik and Kerrick

showed splendid progress. Mr. David Edmund, an Australian pupil, joined the school, and had his first lesson in the controls.

Salisbury Plain.

Bristol School.—No flying was possible on Monday of last week on account of the terrific wind blowing. Tuesday was more propitious, and some excellent work was put in by Pixton on the two-seater monoplane from the Bristol works at Filton. He got away quickly, and to a great altitude, landing by means of a beautiful *vol plané*. Hotchkiss by this time was making a circuit on No. 55, Jullerot also being out giving lessons to Lieut. Edmunds, Mr. Jennings, and Lieut. Ercole.

Wednesday Jullerot found the weather fairly favourable, and amongst those in the air were Gordon England, Lieut. Edmunds and Lieut. Antonini. Lieut. Freeman made two good solos on No. 55, Jullerot giving lessons to Lieut. McArthur and Mr. Jennings. Gordon England was also taking Lieuts. McArthur and Edmunds. Col. Smeaton made a fine solo finishing with a graceful landing, after which Pixton with Lieut. Ashton as passenger set out on one of the Bristol monoplanes for Brooklands. News arrived later that he had successfully reached his destination, having covered the distance of about 60 miles under an hour. Lieut. Edmunds made three fine solos.

Thursday was a fairly busy day, Jullerot and his staff giving lessons to all the pupils, some of whom flew for solos.

Friday the wind was very strong all day, and school work was considerably restricted. However, advantage was taken of calm intervals, and a few flights were made.

Jullerot was out first thing making a trial, after which he gave a flight to a visitor. Lieut. Edmunds, who has been making good progress, was taken out for *vol plané* practice, Lieut. Hall going for a solo trip. The tests for the second part of his certificate were then passed by Lieut. Freeman, who has shown himself an adept at flying. Two other pupils successfully passed their tests, both carrying out their flights in fine style. This completed the morning's work. Towards evening Jullerot again had his staff out, but found the wind very strong, and the only flights made were by Jullerot, who managed his flight machine splendidly in face of the treacherous state of the wind.

Royal Flying Corps.—Unsuitable weather and the Easter Holidays are accountable for the fact that there has been practically no flying during the past few days. On Wednesday week there was just a spell of calm, when Mr. de Havilland arrived on his new Army biplane from Farnborough. He reported having had a varied experience, having to land once to enquire his way through being lost in the fog, while he also had to fly round Stonehenge before he could locate the hangars. About six o'clock in the evening, Mr. de Havilland remounted his machine and after several circuits of the aerodrome, during which he had risen to a height of about 1,000 ft., he headed off for Farnborough, the machine exhibiting a very fine turn of speed. Capt. Fulton and Lieut. Reynolds put in a little practice during the day on their biplanes. The school then closed down for a week's holiday.

AERONAUTICAL SOCIETY OF GREAT BRITAIN.

OFFICIAL NOTICES AS SUPPLIED BY THE SECRETARY.

Council for 1912.—As the result of the recent election the Council for 1912 is composed as follows:—

Associate Fellows.

Griffith Brewer.
Capt. A. D. Carden, R.E.
T. W. K. Clarke.
J. W. Dunne.
J. H. Ledebor.
Alex. Ogilvie.
Mervyn O'Gorman.
F. Handley Page.

Members.

A. E. Berriman.
Col. J. E. Capper, C.B., R.E.
B. G. Cooper.
Lieut. R. Gregory, R.N.
Capt. E. M. Maitland.
F. K. McClean.
Col. H. E. Rawson, C.B., R.E.
Major-General R. M. Ruck.

Meetings.—The fifth meeting of the present session will be held at the Royal Society of Arts, John Street, Adelphi, on Monday, April 15th, at 8.30 p.m., when Mr. T. W. K. Clarke, B.A., A.M.I.C.E., will read a paper on "Auto-mechanical Stability, with a description of a new Gyroscopic Apparatus" (which will be shown in action). Prof. John Perry, F.R.S., of the Royal College of

Science, one of the greatest authorities on the gyroscope, will preside.

The sixth meeting of the present session will be held at the Royal United Service Institution, Whitehall, on Monday, April 29th, at 8.30 p.m., when Capt. C. H. Ley will read a paper on "Aerial Topography."

The seventh meeting of the present session will be held at the Royal United Service Institution, Whitehall, on Thursday, May 16th, at 8.30 p.m., when Mr. F. H. Bramwell will read a paper on "Aeronautical Research at the National Physical Laboratory."

Informal Meetings.—Meetings of an informal nature will be held at the Society's offices, 11, Adam Street, Adelphi, on Mondays from 5 p.m.

The next informal meeting will be held on Monday, April 22nd, when the subject for discussion will be the "Atmospherical Conditions at Hendon Aerodrome."

T. O'B. HUBBARD, Secretary.

The French Safety Competition.

FOLLOWING on several fatal accidents which occurred in France, the Paris municipal authorities organised a competition with the object of encouraging inventors of safety appliances on aeroplanes. Altogether 115 inventors submitted devices of one sort or another, and seven have been selected to share the prize money of £650. The successful entrants are M. Dautre, automatic stability device; Capt. Eteve, speed indicator; M. Hervien, emergency parachute; M. Huguet, longitudinal and lateral stabiliser; M. Cremoux,

device to prevent petrol tank explosions; M. Detable, automatic stabiliser and M. Wilders, safety petrol valve to prevent flame flashing back to carburettor.

More Entries for Peugeot Prize.

SEVERAL more entries have now been received for the Peugeot prize for a ten metre human flight or Concours de l'Aviette, as it is called in France. The entrants now number 114 and further entries will be received up to May 20th. The competition will be held on June 3rd at the Paris Parc des Princes cycle track.

FOREIGN AVIATION NEWS.

No Lottery for French National Fund.

IN connection with the proposal of the Marquis De Dion that a great lottery should be organised for the benefit of the French National Fund for the purchase of aeroplanes, the Minister of the Interior has informed the President of the fund that the Government feel bound to oppose such means of raising money even though it is for a good and useful object. In view of the existing lottery regulations they cannot see their way to make any exceptions in the present case.

Cross-Country Flying by French Military Aviators.

AT the end of last week quite a large number of very fine cross-country flights were made by various French military aviators. By way of example, on the 5th inst., Cavalry Sergeant Hurard on a Maurice Farman made a first test for his superior certificate over a course from Buc to Bonneval and back. Lieut. Fequant also on a Farman machine started from Mailly Camp and flew to Bar le duc and Lieut. Rochette on a Deperdussin went from Foix to Pau landing at St. Gaudens on the way. On the previous day, Lieut. Gourlez on a Blériot went from Villacoublay to La Brayelle taking 2 hrs. 40 mins. for the trip. On Saturday last, he again made the journey, this time on a Deperdussin and the 240 kilometres were covered in 2 hours 9 mins., also on Saturday, Lieut. de Coville on a M. Farman biplane went from St. Cyr to Mailly en Vexin with a passenger and Lieut. Prat made a first test for his military *brevet* on a H. Farman machine over a course from Rheims to Vitry le François. Lieut. Cheutin on a M. Farman went from Bar le duc to Nancy.

French Navy and Aviation.

ON Saturday last, Capt. Fatou, who has charge of the marine aviation, paid a visit to the military flying ground at Rheims, and after inspecting the hangars and equipment there, went for a flight on the Farman biplane, piloted by Naval-Lieut. Fournier.

Long Flights at Pau.

ON the 4th inst. at the Military Blériot School at Pau, Capt. Faure was flying for a couple of hours, sometimes attaining a height of 2,500 metres. Sergeant-Major Didier also made a long flight practising for altitude, while Lieut. Garnier, by way of finishing his course of instruction flew for half an hour. On the previous day Cavalry Sergeant Feierstein covered 150 kiloms. over the course from Pau to Magescq and back, this counting as one of the tests for his superior *brevet*. Sergeant Beatrix also flew for an hour.

Good Flights at Savary School.

AT the Savary Military School at Chartres on the 4th inst., Reichert, the chief pilot, made three long flights of an hour each, and Frantz with a passenger flew to Orleans and back.

A Sommer over Paris.

ON a Sommer monoplane, Kimmerling, on the 3rd inst., flew over Paris, and landed at Vincennes, starting from Issy. He returned to Issy later in the day.

Keeping an Anniversary.

ON the 1st inst., being the second anniversary of his first cross-country voyage from Buc to Orleans, Mr. Maurice Farman, accompanied by Senouque, flew to Chartres and Orleans, and made a call for lunch at Etampes on the way back to Buc.

Paulhan Starts an Aquaplane School.

FOLLOWING on the success of the Curtiss hydro-aeroplane at Monaco, M. Paulhan has returned to his headquarters at Juan-le-Pias, where he is starting a school for marine aviation, as he believes it is an ideal location, the bay being sheltered from rough weather, while there is a fine beach.

The Hydro-aeroplanes or "Aquaplanes" at Monaco.

ALTHOUGH the competitions finished on the last day of March, several of the aquaplanes remained at Monaco, and were in great demand for taking up visitors who wished to see the motor-boat racing from above. On the 4th inst., Fischer started from Monaco to take M. Archdeacon to Genoa. He, however, had to fight his way against the strong wind, and after 40 mins. in the air landed at San Remo, as his petrol supply was getting low. He decided to postpone the visit to Genoa, and returned to Monaco, the trip back only taking a quarter of an hour.

A Bet Won by "Aquaplane."

ON Sunday Renaux, on his Maurice Farman hydro-aeroplane or aquaplane, won a bet of £80, by carrying a couple of passengers from Monaco to Mentone and back, flying across the Bay of Hercules and over Cap Martin, the double journey taking 43 minutes.

Flying Back to Headquarters.

By way of demonstrating the thoroughness of his training at the Blériot Military School at Etampes, Lieut. Sylvestre, on the 1st inst., returned to his station at Poitiers, a trip of 275 kiloms., *en aeroplane*. Leaving Etampes at 7 a.m., he descended at Pontlevoy to replenish his petrol tank, stopped for lunch at Liguil, and landed finally at Poitiers at a quarter past five.

The Astra Biplane Returns to Villacoublay.

AFTER having demonstrated the Astra biplane before the military authorities at Rheims, Labouret on the 3rd inst., set out to fly it back to Villacoublay. After being up for about two hours in a fog which seemed to get thicker and thicker, Labouret came down at Sezannes, where he decided to stay the night. The following day he set off at six o'clock, and after an hour and a quarter's flying landed at Vincennes, from where subsequently to making some flights before the military officers, he flew across to Villacoublay.

A Sommer Biplane at Nice.

ON the 5th inst., Oliveres on a Sommer biplane, with Comte de Robillard Cosnac started from the California Aerodrome at Nice got up to a height of 600 metres flew over to Mentone and returned to Nice, the round trip occupying about 44½ minutes.

Monaco Presents Aquaplane to French Navy.

As a result of the success of the competition for hydro-aeroplanes at Monaco, arrangements have been completed there for the purchase of the winning Henry Farman machine piloted by Fischer and its delivery to the French Navy. It is probable that if a suitable opportunity occurs, Fischer will pilot the machine himself from Monaco to Toulon.

An Italian Commission at Buc.

A DEPUTATION of Italian military officers, comprising Capt. Prandoni and Lieuts. Savoia and Cazzera visited Buc on the 3rd inst. in order to witness some demonstrations in weight-lifting with Maurice Farman machines. They saw a very good flight made by Maurice Farman, the machine taking a load of 500 kilogs. and getting off the ground very easily. Afterwards Capt. Prandoni was carried for a long flight over the surrounding country.

The French Gordon-Bennett Eliminating Trials.

THE Aero Club of France has decided that if it is necessary to hold eliminating trials for the Gordon-Bennett Race they will take place between May 1st and July 15th, under the same conditions as last year, over a distance of 200 kiloms., the course to be 10 kiloms. round.

Flying in Company on Deperdussins.

G. BUSSON, Lacombe and Borie, each on a Deperdussin monoplane flew from Pau to Tarbes on Sunday last, in order to take part in the military fête at the latter place. They returned to Pau on the following day, and starting at two minute intervals reached Pau in the same order.

First Entries for the Grand Prix.

EIGHT entries have already been made for the Grand Prix of the Aero Club of France. The first five are Morane-Saulnier monoplanes, while the other three are Deperdussins.

The Next F.A.I. Conference.

THE next meeting of the Fédération Aéronautique Internationale will be held at Vienna from the 19th to 21st June, while the commission, which is drawing up the International flying map, will meet two days earlier.

The Ae.C.F. Presidency.

As a result of a visit from a delegation composed of members of the committee and sub-committees of the Aero Club of France, M. Cailletet has withdrawn his resignation and will remain as President. After holding that office for seven years he felt he should retire, but could not resist the wishes of his friends.

Aviators in Motor Car Races.

It is not without interest to notice that of the drivers named to take part in the Grand Prix motor races of the Automobile Club of France, a round dozen of them possess pilot-aviators' licences. Of the British representatives, Harry Ferguson who will drive a Vauxhall, and Conway Jenkins who will steer an Arrol-Johnston, are in this category.

No Advertisements for French War Office.

THE French Military authorities have taken a wise step in deciding that aeroplanes presented to the Government must not bear names which savour of advertising, and so far the decision does not seem to have had any adverse effect upon the contributions to the National Fund. The four Parisian newspapers which headed the subscription list have readily fallen in with the idea and the three machines presented by the *Matin* will be known as the "Patrie," "Republic" and "Democratie"; those given by the *Journal* will bear the names "Carnot," "Kleber" and "Marceau"; the *Petit Parisien* trio will commemorate the Battles of "Jemappes," "Valmy" and "Marengo"; while Camine and Lieuts. De Grailly and Seville will be remembered by the three given by the *Petit Journal*.

The Berlin Circuit.

THE flying race round Berlin, which promises to be quite an important event has been fixed to take place on the 24th and 25th August next. The competitors will start from Johannisthal and steer back to Johannisthal via Schulzendorf, Spandau, Potsdam and Telstow. Each competing aeroplane will be required to carry a useful load of not less than 180 kilogs., made up of two men and ballast. The Berlin Municipality has voted a sum of £2,500, the Minister of War has offered a prize of £500, while the Berlin Aeronautical Society, the German Aero Club, and the Kaiserlicher A.C. have subscribed £1,500 for the prize fund.

Cross-Country Flight in Germany.

ON the 4th inst., in calm but exceedingly cold weather, Volmuller successfully made the trip from Schnyderdingen to Bremen, a distance of 175 kiloms.

A New German Society.

UNDER the Presidency of Prince Henry of Prussia, a meeting was held in Berlin on the 4th inst., at which it was arranged to start a new organization, to be known as the Aviation Scientific

Society, and, as its name implies, its labours will be devoted to the scientific and technical sides of aviation. The annual subscription has been fixed at 20 marks.

The New Flying Stations in Germany.

THE reorganisation of the fourth arm of the German army is proceeding apace, and the station at Metz was opened on Wednesday last with eight biplanes and six monoplanes, while Monday will see the inauguration of the centre at Strasburg with six biplanes and a similar number of monoplanes.

Military Competition for Italy.

THE Italian Minister of War is organising a competition for military aeroplanes built in Italy, although the motors may be of foreign construction. Foreign constructors being either represented or having works in Italy, will thus be able to compete. The machine classed first will be awarded a prize of £4,000, while the Government will purchase five machines at a cost of £10,000.

It is probable that the competition, which in its general arrangements will most likely be on similar lines to the French trials recently held, will be carried out in April of next year on an aerodrome in the North of Italy. A rough outline of the competition is that the machine should make a flight of 300 kiloms. without landing, carrying passenger and pilot of not less than ten stone each and a load of petrol weighing not less than 40 kilogs. The minimum speed required will be 80 kiloms. an hour.

A Fast Italian Monoplane.

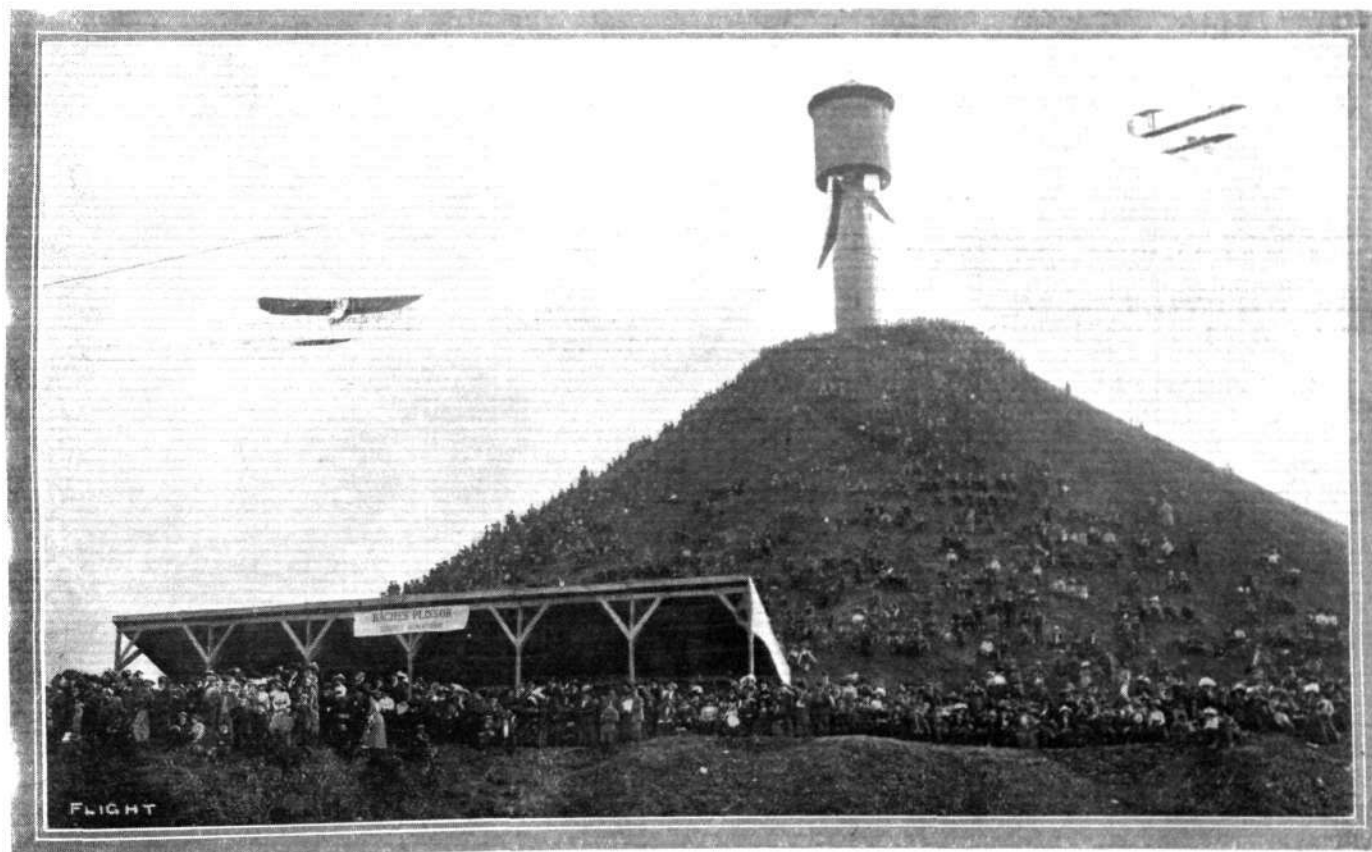
ACCORDING to a report from Milan, the new monoplane built by the Caproni firm has proved very fast. Fitted with a 50-h.p. Anzani engine, and tested over a 5-kilom. course on the 28th ult., it covered 330 kiloms. in 3h. 5m. 30c.

Flying over Lake Lugano.

ON a Blériot monoplane on Saturday last Attilio Maffei made a long flight over Lake Lugano and afterwards passed over Castagnolo, Mount St. Salvatore and the towns of Lugano and Baradico.

Aviation in French West Africa.

THE Governor-General of French West Africa is taking an active part in the organisation of an aviation centre at Dakar, West Africa. He has bought two Henry Farman biplanes, and last month M. Carles, flew between Bambey and Dakar, a distance of 150 kilometres in two hours.



FLYING AT THE NANCY AVIATION FETE.—A fine natural grand stand. Kuhlring on his Blériot monoplane, and Leridan on a Henry Farman machine, are seen in flight.

U.S. Post Office and Aviation.

WHEN the estimates for the United States Post Office were published some gratification was expressed in American aeronautic circles at the inclusion of an item of \$50,000 for aeronautic experiments. The item has, however, been knocked out in committee, and there appears to be little likelihood of it being put back.

Standard Oil Co., Denies Prize Rumour.

AN official denial has now been issued by the Standard Oil Co., to the rumour that they are offering or intend to offer a prize of £5,000 for a new type of internal combustion engine or turbine especially suitable for aviation purposes.

Aeroplanes as Contraband of War.

It is understood that the refusal of the U.S. Army Department to permit delivery of French aeroplanes to the Mexican rebels at El Paso, and treating them as contraband of war, has been approved by President Taft.

A couple of Nieuport monoplanes were seized by the Italian Customs at Bellinzona Station last week on it leaking out that the machines were *en route* for Turkey.

Fatal Accident to Rodgers.

ALTHOUGH only scanty details are as yet to hand it would appear that the fatal accident to Galbraith Rodgers, who made a name for himself by flying across the United States from New York to California, was largely due to recklessness. He had been giving exhibition flights at Long Beach, California, on the 4th inst., and had been amusing himself by scattering a flock of gulls by diving into them. In the last dive the machine apparently failed to answer the controls and crashed to the beach 100 ft. below. The pilot had his neck broken and must have been killed instantly.

The International Meet at Chicago.

IN connection with the Gordon-Bennett race, which will probably be held at Winnetka, just outside Chicago, next August the Illinois Aero Club, which has the local arrangements in hand, proposes to hold a big meeting at its aerodrome at Cicero, Ill. An endeavour is also being made to organise a cross-country circuit, to be held after the International race. The tentative route is from Chicago via Milwaukee, Omaha, Kansas City, St. Louis, Indianapolis, and so back to the starting point, a distance of about 1,800 miles. Between these various cities, it is hoped to raise a prize fund of £15,000.

U.S. Army has a Curtiss Machine.

TESTS were carried out at Augusta, Ga., at the end of March with a Curtiss biplane built to meet the U.S. Army's requirements, as detailed in a recent issue of FLIGHT. It went through the endurance test easily with a flight of 2 hrs. 10 mins., and bettered the speed requirements by 2½ miles an hour. It was dismantled for transportation in 33 mins., and was re-assembled for flying in 55 mins. Carrying a load of 450 lbs. and fuel for four hours' flight, making a total weight of over 600 lbs., the machine climbed 1,000 ft. in 7 mins. The chassis proved capable of landing on and starting from soft, musty, and ploughed ground. The machine is, of course, fitted with a Curtiss dual control, enabling either occupant to take charge of it.



Two Good Flights by Mr. Cody.

ON the 3rd inst., Mr. Cody made a couple of good flights, in one of them carrying M. Bizion for a trip of ten miles, during which he dropped a number of handbills, advertising a charity concert. In the other Mr. Cody made a very fine circular flight, taking in Farnham, Alton, Guildford and Camberley.

Memorials to the late Hon. C. S. Rolls.

ON Sunday last, Lady Llangattock unveiled in Llangattock Church, near Monmouth, a marble memorial to her son, the Hon. C. S. Rolls, who was killed at Bournemouth on July 12th, 1910. Meantime the splendid lifelike statue, which has been designed by Mrs. Scott for erection on the sea-front, to commemorate the double crossing of the Channel by the Hon. C. S. Rolls, has arrived at Dover.

British Government and Monoplane Construction.

A QUESTION in the House of Commons as to the attitude of the British Government as to the recent order of the French War Office regarding flying on monoplanes, drew from Col. Seely the information that no special order had been issued by the British War Office but the necessary action was being taken.

THE BERLIN AERONAUTIC EXHIBITION.

WHEN the doors of the Aeronautical Exhibition at Berlin were opened on Wednesday of last week, it was at once evident the great change which has come over Germany in the last year or so. At the Frankfort Exhibition in 1909, the lighter than air craft had matters all their own way, and aeroplanes were conspicuous by their absence, but at the present Berlin Show the aeroplane is in the ascendancy, and airships and balloons are represented by a few models and accessories. As was fitting, the Exhibition was opened by H.H. Prince Henry of Prussia, who is one of the few Royalties to hold a pilot aviator's licence.

Prominent among the exhibits are several Albatross biplanes, which in general appearance are on Breguet lines with the wings arranged *à la* Etrich, while a number of Rumpler-Taube monoplanes, one of which is equipped with a completely enclosed cab for the pilot, somewhat in appearance like the new Avro military type, while another fitted with two propellers also attracted a good deal of notice. The Euler firm are represented by a couple of biplanes and a triplane, the latter equipped with floats for use over water. The German Wright firm exhibit one of their latest biplanes fitted with a single propeller instead of two as is the usual practice. Of the distinctly German machines there are on view Aviatik biplanes, and also a biplane designed by Buchner and built by a new firm. As well as Harlan, Goedecker, Dornier, Haefelin and Garuda monoplanes, the latter machine having curved wings. Prince Sigismund also shows his dragon fly monoplane. Altogether there are to be seen in the exhibition, which is being held in the Zoological Gardens, seventeen monoplanes, nine biplanes and one triplane, besides, of course, a large collection of accessories and models, &c.



AIRSHIP NEWS.

The State of the British Dirigibles.

COL. SEELY questioned in Parliament as to the present condition of the Army dirigibles and whether they could be sailed over London, said there were two airships available for service. They were provided with crews who could and do navigate them from time to time. They were capable of making extensive flights but they were fully engaged in training officers and men, and he did not think bringing them to London (so that the public might see them), was the best way to achieve that object.

A Parseval Dirigible for Japan.

ACCORDING to advices from Berlin, the Japanese Government has purchased the "Parseval XIII," which is now undergoing its trials at Bitterfeld.

Long Voyages With "Capitaine Ferber."

ON the 3rd inst., the dirigible "Capitaine Ferber" left Issy and was cruising over Paris for about an hour. On the following day it was out for two hours, this time passing over Melun, Fontainebleau, Coulommiers, Corbeil, and Longjumeau. Another long trip was made on Saturday last, this time to the west of Paris, the airship having a crew of ten persons on board.

Two Zeppelins Meet at Mannheim.

MANNHEIM had the privilege of seeing the two latest Zeppelin dirigibles cruising overhead on the 4th inst. The "Victoria Louise" with eight passengers started from Frankfort at a quarter past ten, and the "Schwaben" with nine passengers on board left Baden Baden at ten o'clock. The two airships met at Mannheim at ten minutes past ten, and after cruising over the city for half an hour they went off in the direction of Heidelberg. The "Victoria Louise" returned to Frankfort at half past one, and the "Schwaben" returned to Baden later in the day.

Zeppelins for German Navy.

FROM Berlin it is reported that the German Naval authorities are in negotiation with the Zeppelin Co. for the delivery within the next three years of five Zeppelin airships of improved "Schwaben" type. It is also stated that the designs of several battle-ships are to be altered to permit of them carrying a dirigible, while they are also to be fitted with platforms to permit of aeroplanes ascending from and descending on to them.



U.S. Imports and Exports.

DURING the last six months of 1911, thirteen aeroplanes, valued at \$48,644, were imported, while sixteen machines, valued at \$54,004, of American manufacture, were sent out of the United States. Two foreign-built machines, valued at \$9,755, were exported, while there were ten machines in warehouse (in bond), their total value being \$30,873.

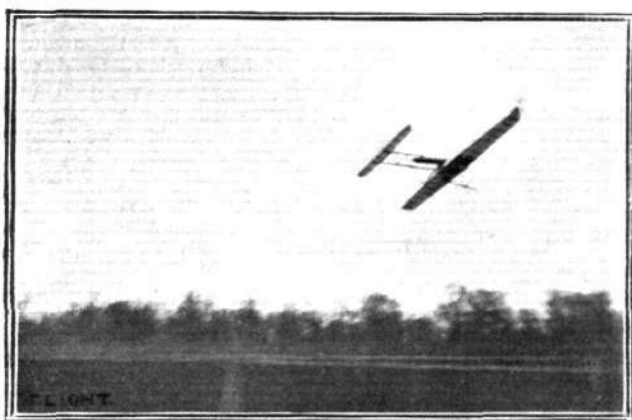
Models

Conducted by V. E. JOHNSON, M.A.

An Entirely New Record.

ON March 31st last, early in the morning (about 7 a.m.), Mr. H. H. Groves (of the Blackheath Aero Club) was successful in setting up an entirely new Model record, and one which if we are not much mistaken, will have some far-reaching consequences so far as models are concerned, at least. The record was made with a steam-driven model (up to then untried in actual flight), of a somewhat similar design to that recently illustrated in FLIGHT, but fitted with a more powerful, or, to speak more correctly, a more lasting generating power plant, *i.e.*, one having a longer duration.

Mr. Groves writes as follows: "The weather was just good enough [to risk trying it] and no more. I was unable to let the engine have more than 1½-oz. of water [owing to ground



Mr. H. H. Groves' steam-driven model in full flight. Notice the fine banking exhibited by the machine.

conditions; the full load is 4 oz.]. The first flight was perfectly satisfactory, the machine leaving the ground after a run of about 12 to 15 yards, then rising gradually to some 12 to 15 ft. and then slowly falling in an accelerated glide as the propeller thrust fell off and landing perfectly with the engine still running slowly; nothing like full pressure had been used in this flight—which partook of the nature of a preliminary character.

The length of actual flight was about 150 yards. The next run proved a failure, the engine not having been given sufficient pressure, and the model finally stuck in the grass. The third attempt was completely successful, the model rising in about 4 to 6 yards and executing a circle of about 50 yards radius (*i.e.*, a flight of somewhat over 150 yards), banked well during flight [see illustration] and finally landed quite safely, still banked to angle of about 30 degrees. The wind was now getting up, but I thought I would chance one more flight with 1½-oz. of water [amount of benzoline used 1¼-oz.]. The engine this time was given more pressure—the valve being opened full—with the result that the model rose after a run of 8 to 12 ft. only, facing the wind, and mounted steadily up to about 100 ft., in 15 to 20 secs., and made a flight 220 yards from the starting point. Since the model faced the wind to start with, and made at least some 50 yards headway previous to turning—taking all this into account this means, at least, 350 to 370 yards.

The total weight of the model including 1½ ozs. of water and 1¼ ozs. of benzoline was 3 lbs. 11 ozs. The climbing was all that could be desired. The engine and propeller make a noise just like a full-sized machine in the air.

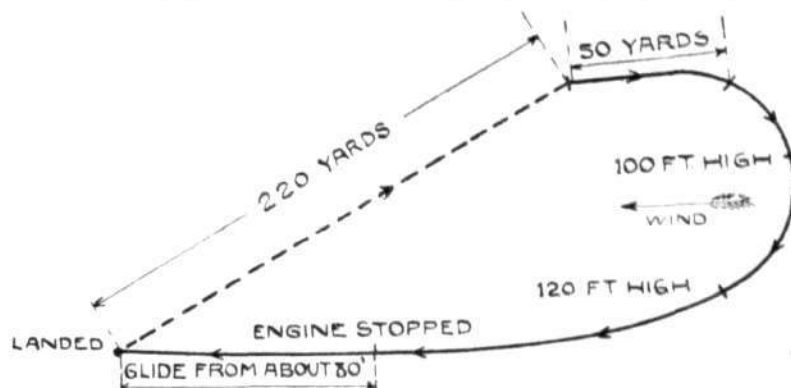
In addition to the photograph which we publish, Mr. Groves forwarded another (which, unfortunately, will not bear reproduction), taken when the model was high up, from this photo, combined with the focal length of his lens and certain well-known properties of light, he deduces the height as not less than 100 feet, a result with which we quite agree. The actual photo reproduced was taken during the third trial (the circular flight). Exposure, 1/100 sec. Time of day, 7 a.m. Stop. F. 11. Imperial special rapid plate.

The following, besides Mr. Groves and his brother-in-law were also witnesses of these flights: Mr. A. B. Clark—a well-known aeromodelist—hon. sec. Blackheath Aero Club; Mr. W. R. Halman (Glanmire, co. Cork); Mr. G. Brown, 20, Vance Street,

New Cross, S.E.; as well as a policeman whose address is known, and a passing spectator whose address was not taken.

Mr. A. B. Clark forwards us the following account: "I arrived on the ground about 6.10 a.m., and found Mr. Groves preparing his model. The first flight was as follows: "Taxied" about 20 yards, and then rose very steadily to about 15 ft., and flew approximately 150 yards. The next [*i.e.*, the third attempt] flight was a short one, a sharp circle to the left. The third flight [*i.e.*, the fourth trial] commenced after a run of 8 to 10 ft., directly facing the wind—now blowing 16 to 18 m.p.h., the model starting to climb at a very good angle—faster than Hamel on his 50-h.p. Gnome-Blériot—until it reached about 120 ft. It had then travelled some 150 yards into the wind, after which it turned down wind, and passed us at a good altitude, and finished up 220 yards away from the start, so that it had travelled something like 500 to 520 yards altogether, *i.e.*, 150 twice plus 220. It finished up with the finest *vol plané* I have ever seen except on one occasion. Mr. Groves is to be congratulated on the results obtained." [A sentiment which we heartily endorse.]

Mr. W. R. Halman writes: "I have read the enclosed letter by



Mr. Clark of Mr. H. H. Groves model, which is correct in every detail, and I can corroborate the same."

Naturally, personally speaking, we are deeply interested in these results, the type of plant being one which we have advocated for some considerable time, and one with which we are personally experimenting with the most successful results so far as all bench tests are concerned. Only on March 30th (with the plant already referred to in these columns) a thrust of no less than 2 lb. 10 ozs. was obtained, sufficient, according to Mr. Groves' results, to launch and fly a 8 lb. model, whereas the one which it is destined to fly will weigh but slightly more than three. In the flash-boiler type we have ample power, and we are fully convinced now that it can be successfully applied to much smaller models—weighing, not 3 to 4 lbs., but 1 lb. only, or even less. At the same time, the reader must not draw the erroneous conclusion that we consider this type of power plant, as yet, to be possessed of a really high degree of efficiency—roughly speaking, we should put it on a par with the rubber motor previous to the introduction of lubrication.

One cannot help contrasting the results obtained with 1½ oz. of water and 1¼ oz. of benzoline, total 2¾ oz., and a machine weighing 3 lbs. 11 oz., with what the same weight of rubber, *i.e.*, 2¾ oz., could do with the same machine; weight of rubber : total weight of machine :: 11 : 236, *i.e.*, approximately, 1 : 21.

The weight of the material necessary to develop or set free the energy contained in the benzoline, &c., is considerable, being in this particular case about 1 lb. 10 oz., whereas in the case of rubber all that is required is the stick or motor rod. The entire model was designed and constructed throughout by Mr. Groves.

The greatest difficulty in connection with power-driven models is a suitable ground on which to try them to their full capacity with any feeling of safety; it is not so much a question of bad landing, as of trees or other obstacles; also pools of water or small lakes into which the model might fall. It is all very well to say set the rudder or warp the wings so that the model will circle, in the case of three or four minutes' flight; even on a comparatively speaking calm day, there is the question of drift to be considered, and if there is anything nasty knocking about the model is sure to find it. Another half-an-ounce of water only in Mr. Groves' last and best flight would have landed his model in serious difficulties.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

Notes regarding Clubs must reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

MODEL CLUBS.

Birmingham Model Aero Club (Secs., R. COBHAM, G. H. WOOD, 8, FREDERICK ROAD, EDGBASTON).

At the meeting at the Bell Inn, several discussions took place, the chief being "aeroplane stresses." Mr. L. West, Mr. Siddlerly and Miss D. Wood were elected as new members.

At the practice last week-end the most prominent were Messrs. Trykle, Wilde, Mason, Rogers, Lunn, Wood and West.

At Coventry the contest was abandoned owing to the gale which was blowing. For all that, however, Mr. E. Trykle obtained a flight of over 700 yards, and Mr. G. Haddon Wood 660 yards. The members were then entertained to a tea and a highly enjoyable day was finished with a peep through the sights of Coventry.

Upon the question of inter-club contests, it was decided that if some influential gentleman could not be induced to put up a cup or shield, all the clubs should be asked to subscribe together for one for competition amongst the clubs.

Blackheath Aero Club (Hon. Sec., A. E. WOOLLARD, 48, HAFTON ROAD, CATFORD, S.E.).

At Grove Park on Friday, Mr. Brown's "Fearless" biplane made a flight of 47 secs. duration. Mr. Egelstaff obtained his 2nd class certificate with a flight of 210 yards. Messrs. Clark and Jarvis also present with models.

On Saturday, Mr. A. B. Clark's 24-oz. "Victors" flew distances of 648 and 635 yards, Mr. Brown's biplane 476 yards, and Mr. Morris' single stick model 375 yards, thus obtaining his 2nd class certificate; he also obtained a duration of 44 secs. It will be remembered that these durations are attempts to win the W.H.C. prize model. Messrs. Woollard, Jarvis, Bailey, and Egelstaff also flying.

At Blackheath, Mr. J. H. Dollittle made a flight lasting 75 secs., which is a club record; the previous best was 61 secs., by Mr. A. B. Clark. Mr. F. Whitworth, with a 1-1-P-O model, obtained a duration of 43 secs. Mr. R. Halnan, with an "A" frame, 349 yards.

Next week-end, flying will take place at Grove Park; the Lee ground will not be available for flight again for some time.

Bristol Model Flying (Sec., R. V. TIVY, 3, ROYAL YORK CRESCENT, CLIFTON).

DURATION competition on April 6th. Prizes (pair of propellers presented by Mr. R. M. Haines) won by Mr. Moore, duration 20 and 18 secs. in howling gale; 1-1-2P model with flat plane and slight "vee."

Meeting to-day (Saturday) at 3 p.m., at Sea Walls. Prize (pair of laminated propellers) for first model to rise from ground and fly 100 yards, may be competed for; weight must exceed 6 ozs.

Conisborough and District Aeroplane Soc. (18, CHURCH ST.)

ON April 18th Messrs. F. J. Wright, J. E. Dickinson and C. C. Allport will give exhibition flights in the Pleasure Grounds at Skegness, and it is hoped this will lead to forming a club there, the first to be formed in Lincolnshire.

Mr. C. C. Allport has been giving a number of exhibition flights at Woodhall Spa.

Coventry Aeroplane Building Society (Sec., J. W. SCHOFIELD, 22, KINGSTON ROAD, EARLSDON).

THE new commodious workshop, situated in Godiva Street, is a large yard with a fairly large piece of ground for gliding, tuning up models, and erecting glider, &c. Members and others are invited to pay a visit on April 12th at 3 p.m. Aero clubs in the Midlands, willing to discuss the advisability of arranging inter-club matches, please communicate with the Secretary.

Croydon and District Aero Club (158, HIGH STREET).

ON Good Friday a gale was blowing, and the competition was postponed until April 20th. Messrs. Bell, Rodent, P. Hart, and C. Smither made good flights, Mr. C. Smither getting a flight of 1,125 ft., and the Secretary a flight of 1,395 ft. These flights were measured in a straight line from the starting-point, and the models were launched against the wind, and had a hard fight before turning. On Saturday, Mr. Pavely obtained a flight of 54 secs., and therefore holds Club's record.

Ealing and District Aero Club (Sec., B. J. KIRCHNER, 1, QUEEN'S GARDENS, EALING, W.).

ON Good Friday, Mr. L. Roche was flying a 0-1-1-2 model, on one occasion getting 1,080 ft. the club distance record. J. Pratt also flew. On Saturday, L. Roche, A. Houlberg, Chilcott, Beeching, G. Pearson, Saunders, Margetson and Pratt were flying. Chilcott used both 1-1-0-2 P and 0-1-1-2 P models and obtained fairly good flights, as also did L. Roche, G. Beeching and G.

Pearson who got to good heights with their models, while Sanders was testing a new model. A. Houlberg broke the club's distance record, made the previous day, with distances of 1,336½ ft. and 1,444 ft., the latter being accordingly the record.

Flying at Greenford Saturday.

Hackney and District Aero Club (Sec., B. H. LONGSTAFFE, 47, JENNER ROAD, STOKE NEWINGTON, N.).

THE following are the winners of the Easter competitions: steering and stability, P. Gittus; duration, P. Gittus, with 30 secs.; altitude, Mr. Hill. The prizes, consisting of planes, fuselages, propellers, &c., will be distributed at Sporsley Hall meeting on Friday. Mr. Levin was testing his hydro-plane on the River Lea during the afternoon, his machine, a Bragg-Smith biplane, attracting large crowds of spectators.

Paddington and Districts Aero Club (Sec., W. E. EVANS, 133, BUCHANAN GARDENS, HARLESDEN).

COMMITTEE passed rule that models used in club certificate trials, 1st and 2nd class, must be constructed throughout by the competitor. W. Evans is the first member to gain a club certificate, qualifying for the 2nd class with 30½ secs. and 640 feet in separate flights. In his duration test he covered about 750 feet straight, but this did not count. The following members qualified for duration part of 2nd class certificate: W. Jackson, 37 secs., and C. Dutton, 28 secs. Other durations were C. Levy 46 secs.; H. Weston 39, 37 and 28½ secs. Woolley's rise-off-ground model flew well. Wind was very treacherous at times and resulted in a complete smash of H. Hurlin's promising model.

Saturday, April 13th, Kite and Model Aeroplane Association trials at Parkside at 3 p.m.

New members elected: E. Evans (age 10), T. Officer, and R. Silent.

Reigate, Redhill and District Aero Club (Sec., H. V. MAY, 4, LONDON ROAD, REIGATE).

ON Wednesday, last week, several members were out at 6 a.m., and in the afternoon experiments were made with Messrs. Cox's 6-ft. kite, carrying the club banner. Sunday morning, May, Lewis and Norton were flying, Mr. Leides obtaining 331 yards with "Almono," and Mr. May at Reigate Heath 325 yards and 48 secs. duration. In the evening Norton got 278 yards with mono-plane, May 58 secs. duration. Monday heavy winds. Osborne, May and Cox obtained flights of 100 to 175 yards. The Committee hope to bring the competitions on again on Saturday week at Earlswood. Flying as usual on the club ground on Saturday (to-day) at 2.30.

Salisbury Model Aero Club (Sec., E. M. LEAR, VICTORIA COFFEE ROOMS, BUTCHER ROW).

ON Wednesday week, at Wilton Road, Sperring obtained 558 ft. Lear obtained his 2nd class certificate with a flight of 502 ft., and also made further flights of 484 ft. and 438 ft. Besent with 3½-oz. model obtained 472 ft. (28 secs. duration) and 365 ft. This model rose to a height of about 90 ft. O. F. Noyes, "tuning up" model, obtained 250 ft. No flying last Saturday owing to high wind.

The club wishes to tender its best thanks to Mr. E. J. Taunton, who has kindly placed his magnificent field at the disposal of the club members.

Easter flying attracted a good deal of outside attention. On Good Friday morning, at Wilton Road, Sperring obtained distances of 840 ft. and 900 ft. with 4-oz. machine; Robinson obtained 450 ft., and Besent 375 ft. The bad weather debarred competitors from outlying districts, and only three entries were made: Sperring, Robinson, and Besent. Sperring won the 10s. 6d. worth of model accessories with a flight of 518 ft. in 25 secs. duration. The secretary (whose 5-oz. machine was too heavy for competition) gave some good exhibition flights, on one occasion obtaining 600 ft., absolutely straight flight.

General meeting at headquarters on April 16th, at 7.30.

Scottish Ae.S. Model Aero Club (6, McLELLAN STREET, GOVAN).

A MEETING of members will be held in the Institute, Elmbank Crescent, Glasgow. The summer programme is now being made up, and suggestions from members will be thankfully received by the committee. On Saturday, April 20th, a competition for the aggregate prize will be held at Barrhead Aerodrome.

Events: distance and duration; flying to commence at 3 p.m.

Sheffield Model Aero Club (Hon. Sec. C. F. W. CUDWORTH, 35, PENRHYN ROAD, SHEFFIELD).

OWING to the boisterous weather Easter Monday, the competition was abandoned until Whit-Monday, when the Colver Cup, for self-rising model aeroplanes, not under 4 oz., will be competed for for the first time. Mr. E. W. Colver has now decided to defray the whole cost of the cup, including engraving of same, plinth, &c.

Sheppey Model Aero Club (Sec., G. G. HARRIS, 40, WOOD STREET, SHEERNESS).

FULLER and Goodhall during the week have both put up flights exceeding 500 ft. G. Harris, with his rise-from-ground model from W.H.C. parts, was also successful, and he obtained 43 secs. duration with his 0-1-1-2 P type model. Meeting at Norlands Marine Parade on Saturday, 13th inst. Will firms forward catalogues for members' use.

Stony Stratford and District Kite and Model Aero Club (Hon. Sec., O. HAMILTON, JUN., OLD STRATFORD).

OWING to the boisterous nature of the wind which at times was blowing fully forty miles an hour, it was decided to postpone the Members' competitions till Saturday, April 13th; but so as not to disappoint the spectators who had assembled to see some flying, it was decided to hold the Juniors' open event, in which three came to the judge's post, these being Master Edgar Toombs, Horace Moore and Miss Phyllis Brown. Angle when measured were as follows:—Toombs, 38°; Moore, 30°. Marks being given for angle, stability,

strength of construction and collapsibility, the winner scored the maximum of 40, while Moore scored 36 marks, losing on stability and angle. In the open event, in addition to the guaranteed prize, Mr. Brown kindly added one of his kites which he builds specially for juvenile flying.

Members' meeting on Thursday, April 11th, usual time.

SCHOOL AERO CLUB.

Southgate County School Ae.C. (84, BOWES RD., PALMER'S GREEN).

AT duration competition on April 3rd, when all the machines were designed and constructed throughout by members, about a dozen models were entered, the longest flight being 69½ secs., by E. R. Brown's 2½-oz. "tail-behind" model; 2nd prize, E. R. Marsh, 41 secs.; G. Ellinghaus, 3rd, 39½ secs. Other good flights were put up by Bartlett (26 secs.), Redotée, Shurlock, and Petty. Mr. Paull, the club president, kindly undertook the duties of timekeeper.

Flying, during the vacation, at Powys Lane, on Tuesday and Friday afternoons.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Flight Terminology.

[1524] Your correspondent 1522 has raised rather an interesting point under this heading; do you not think, however, that it is better to keep on with the present system of calling each new machine, or distinctive feature, after the name of its originator? For instance, when one mentions a machine of the Goupy type, you know the main planes are staggered. Farman-type signifies the biplane with a forward elevator and a lifting tail. Avro-type, the biplane with a tubular body and the engine in front. Nieuport, the deep body with flat sides. Breguet, the biplane with only the forward struts between the main planes. It would be a thousand pities if the names of the pioneers who have introduced the various features were allowed to be dropped.

The most suitable name for hydro-aeroplane is undoubtedly hydroplane, but as this already has a meaning, I do not think one can beat your correspondent's suggestion, aquaplane, for it is easy to say and easy to remember.

Royal Aero Club.

SANS CULOTTE.

Prices of Aeroplanes Wanted.

[1525] I should be very much obliged if you could inform me, either privately or through the columns of your excellent paper, where I can get a catalogue or price list of some kind, giving the cost or approximate cost of the leading makes of aeroplanes of the day. Advertisements all appear to be conspicuously lacking on this score.

Maida Vale.

"MUGWAMP."

Military Airships.

[1526] With reference to Mr. F. T. Jane's letter No. 1516, commenting upon Lieut. C. M. Waterlow's paper, I should like to point out that he has mentioned the "Gamma" as being unique in having swivelling propellers. This is somewhat incorrect, as the system of altering the angles of propellers was employed by me at Cardiff long before the "Gamma" was built. It appears that Mr. Jane is not referring exclusively to military craft, as he has mentioned the proposed American dirigible "Rekar," otherwise his assumption would have been correct.

E. T. WILLOWS.

Helicopters and Insect Flight.

[1527] I have just finished reading Mr. Berriman's very interesting book on the *Principles of Flight*. I have no fault to find with his definition of a helicopter, but I must, most respectfully, object to his statement, on page 18, that my theory of insect flight, "Fundamentally . . . puts some insects in the helicopter class."

Mr. Berriman, obviously, has never read my article on the vortex principles of flight, which appeared in *FLIGHT* last June, or he would have recognised that that principle, or "theory," is the very converse of the helicopter principle in every particular. I have studied insect flight for the past 17 years without discovering the existence of anything in the remotest degree resembling the helicopter or screw propeller. The far-fetched hypothesis of the "Figure-of-eight," put forward by M. Marey some 44 years ago, was probably at the back of Mr. Berriman's mind. But this hypothesis never got within measurable distance of theory, to say nothing of fact. If it could be shown that a "Figure-of-eight" path would give lifting power to a wing the application of such lifters to an insect's would, of course, place that insect in the position of a

helicopter—it would be unable to fly. This is one of the numerous fatal objections to the Marey hypothesis.

The helicopter is only a qualified success as a lifter, but it is an utter failure in regard to horizontal progression. It requires the lifting force to be absolutely vertical, and to pass through the centre of gravity. If such a lifting force be inclined from the vertical it will not give a horizontal motion to the body of the machine, but will itself return to the vertical position, the body swinging about the centre of gravity to allow it to do so. If the lifting force pass outside the centre of gravity a couple is formed which upsets the machine.

In all the hawk-moths, clear wings, bees, wasps, and flies that I have examined, Nature has placed the centre of gravity some distance to the rear of the point of suspension from the wings, and has not applied the lifting force in line with these two points. She deliberately creates a couple which if left unbalanced would cause the insect to turn a backward somersault. By giving separate support to the abdomen she creates a second couple which counteracts the first. This is done by the expansion of that portion of the air stream which is discharged by the wings beneath the body of the insect. The bee hawk-moth, which has a very long abdomen, is, indeed, the proud possessor of a tail, spread out when the insect is hovering in order to preserve the horizontal position of the body by making the most of the expanding air currents.

Now that the lifting and propelling power of a full-sized "Vortex propeller," built and tested at a large engineering works, has been proved to be all that was claimed for it, there is no longer any doubt as to the ultimate success of the machine which has been designed to emulate the flight of these insects. T. A. DRING.

[The helicopter class, in "Principles of Flight," has rather an indefinite boundary. Any mechanism, diurnal or mechanical, stated to be of a rotary character and capable of supporting itself at a fixed point in space thereby is included therein for want of further categories. Again, it is important to bear in mind that "Principles of Flight" is an elementary treatise based on the Newtonian method (see *Flight Manual No. 1*) which essentially regards all aerodynamic support as the result of the reaction derived from maintaining a discharge of air through a known and determinate area. The well-known practical limitations of this system do not detract from its value as a first line of thought for students.—ED.]

Bicycle Glider.

[1528] Is it possible to fit small planes to an ordinary pedal cycle to use same as a glider? If so, how large would the planes need to be, and what speed would have to be attained in order that the machine could leave the ground? My machine is geared to 94, and is an ordinary roadster. I should also like to know the best method of fixing the planes to the frame of the cycle.

Norfolk.

FLYING FOX.

[A pedal bicycle fitted with wings might conceivably be ridden fast enough to make it jump off the ground, but gliding is limited by the extent to which the force of gravity can be utilised for propulsion and therefore a glide can only take place down hill. It would be unnecessarily dangerous to practise gliding with a machine such as is proposed, because it is feasible to adopt a better and safer method of practising in moderate steady winds, as the Wright brothers did when they began. Gliding of this sort does not involve high velocities over the ground, and with reasonable care there is little danger.—ED.]

GYROSCOPES ON AEROPLANES.

OF all simple mechanisms, the gyroscope is perhaps the most fascinating that man has ever invented. As a toy it amuses, and as an instrument it grips the imagination in a way that scarcely anything of a similar character surpasses. Often it has been suggested that the gyroscope would form an appropriate means of stabilizing an aeroplane, and the subject is about to be laid open for discussion by the Aeronautical Society, before which body Mr. T. W. K. Clarke is to read a paper next Monday evening at the Royal Society of Arts. Prof. John Perry, F.R.S. of the Royal College of Science, one of the greatest authorities on the gyroscope, will preside. In collaboration with Mr. V. E. Johnson, Mr. Clarke has evolved a particular system in which the gyroscope can be applied to the stabilizing of aeroplanes and the exhibition and description of this apparatus will be incidental to the subject matter of the paper. Owing to the importance of the subject generally and the especial interest that attaches to a discussion on the possibilities of a specific application of the principle as illustrated by an actual apparatus, the occasion is likely to give rise to one of the best meetings that the Aeronautical Society has yet held, and those of our readers who are members would be well advised to make a note of the time and place in order that they may not forget to attend.



PROGRESS AT THE EWEN SCHOOL.

CONTINUING the progression that has marked his operations since he established his flying school at Hendon, Mr. W. H. Ewen has within the last week completed negotiations for the acquirement of the sole agency of Caudron aeroplanes—monoplane, biplane, and hydro-aeroplane—for Great Britain and the Colonies. So many pupils has his school attracted that something more than the provision of his two present monoplanes, and the one he has now under construction, became necessary. His choice seems to us a happy one, for the little Caudron biplane, is by virtue of the suppleness of its supporting surfaces, an eminently easy machine to handle in a wind. Further, from the point of view of school work, it is quite an inexpensive machine to construct, so that pupils need scarcely fear being presented with lengthy bills of breakages. The monoplane is, too, quite an excellent little machine, we believe, being simple and so efficient that with a 35 h.p. Y-type Anzani motor it can maintain a speed of something like 65 miles an hour. As a single-seater racer, inexpensive in first cost and maintenance, it should appeal to the would-be competition entrant. As for the hydro-aeroplanes, the representative at the Monaco meeting showed up well, considering that that particular machine was "faked up" from a very old *cellule*, and other out of date odds and ends from the Caudron works. Even then it parted company with the water in the remarkably short time of 11 secs. We understand that the Caudron firm hold an important patent relating to hydro-aeroplane undercarriages of the combined wheel and float type, on the disposition of the wheels to the rear of the floats. Regarding the ability of the Caudron biplane to weather a strong wind, on the occasion of the visit of Mr. Ewen and his friend Mr. A. M. Ramsay, of the Grahame-White school, to the Caudron works at Crottoy, M. Caudron brought out his 35-h.p. Y-type Anzani biplane, late on in the day when a wind from 25 to 30 miles an hour was blowing. That he should attempt to fly such a low-powered machine in such a relatively high wind rather surprised the English visitors, in fact the astonishment shown by them at M. Caudron's performance was the source of much amusement for the works staff there. Facing up to wind the machine left the ground after a run of about 10 feet, and in the air did not rock bodily from side to side as many machines incline to in showing their resentment of being flown under unfavourable weather conditions. All that was noticeable was a constant quivering of the wide flexible trailing edge. In bringing the machine to earth it quickly came to a standstill, and as it was just being blown backwards owing to the force of the wind, M. Caudron switched on his motor again, and rose clear of the ground almost as if his machine had been fitted for direct lift.



The Royal Flying Corps' Headquarters at Salisbury Plain.

WORK is already well under way with the hangars for the School of the Royal Flying Corps at Upavon on Salisbury Plain, and in the experienced hands of Messrs. Harbrow and Son, of South Bermondsey, who make a speciality of such work, they should be quite ready within the stipulated time, although it is so very short. The contractors have only ten weeks in which to erect the hangars, lecture rooms, officers' quarters, and men's barracks, but some of the buildings, which will be of a semi-permanent character, will be finished off early, so as to provide some accommodation to allow training work being commenced.

Who said no Business doing?

IN last week's issue of FLIGHT the sale by auction on April 24th was announced of the entire stock of aeroplanes, engines and accessories of the Aeronautical Syndicate, Ltd. This little public function will now be "off," as with remarkable enterprise Messrs. Handley Page, Ltd., of 72, Victoria Street, S.W., at once entered into negotiations to purchase, and as a result have acquired the entire stock, lock, stock and barrel, except the tools. Anybody, therefore, desirous of obtaining any of the individual items advertised under the auction notice can now enter into a probable deal with Messrs. Handley Page, Ltd., who are prepared to sell all or any of the goods acquired by themselves. In this little deal, besides all the accessories are included the new Viking machine, three Valkyries, two 50-h.p. Gnome engines, one 60-h.p. Green engine, and one 30-40 Green engine.

Aeronautical Consulting Engineers.

ONE of the earliest firms in this country to take up consulting work in connection with aeronautics was Messrs. Markham and France, of Dudley House, Southampton Street, Strand. Three and a-half years ago we referred to the fact that they were open to obtain Wright or Voisin machines; and although times have changed since then, the firm keep themselves thoroughly up to date, and, as they do not hold any agency for any particular machine, they claim to be able to give unbiased advice, and to furnish any type of make desired.

Proposals for New Clubs.

THE following gentlemen are anxious to communicate with others in their district with a view to clubbing together for the purpose of studying aeronautics, building small models &c. :—

Mr. C. A. Burkitt, 23, Southill Park Gardens, Hampstead, N.W.
Mr. Harold Moone, 3, Vicarage Walk, East Grinstead, Sussex.
Mr. B. S. Hirst, 32, Chelmsford Street, Oldham.
Mr. Arthur C. Woodman, Portland Private Hotel, Malvern.



Aeronautical Patents Published.

Applied for in 1910.

Published April 11th, 1912.

29,531. I. H. STOREY. Flying-machines.

Applied for in 1911.

Published April 11th, 1912.

10,638. R. E. SCOTT. Discharging projectiles from aerial machines.
12,962. KLAUCK AND J. C. BELL. Airships.
25,592. A. MARIE. Shock-absorbing suit for aviators.
26,940. C. MARSTON AND W. J. DIMENT. Aeroplanes and gliders.
27,161. R. J. ISAACSON. Mounting of propellers.
27,800. B. LOUTZKOV. Propulsion of flying-machines.

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